

INTERNAL OPERATING PROCEDURE FOR CHHATTISGARH STATE GRID

OPERATING PROCEDURE FOR CHHATTISGARH STATE GRID

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OBJECTIVE

In compliance to the requirement of CSERC Grid code-2011, Chapter-5 Operating code, item no. 5.1(3), a set of detailed internal operating procedures for the State grid shall be developed and maintained by the SLDC in consultation with the intra State entities, RLDC which shall be consistent with State Grid Code and IEGC, 2010 and its amendments. These internal operating procedures shall include the following structure:

- i. Black start procedures.
- ii. Load shedding procedure.
- iii. Islanding procedure.
- iv. Any other procedure considered appropriate by the State Load Despatch Centre.

The primary objective of internal operating procedure is to clearly specify the roles of each player in the CG grid i.e., State owned Generating, Transmission & distribution Utilities and other agencies operating in the power CG grid to maintain grid safety and to facilitate grid operation in reliable, efficient and economic manner. It also describes their role in order to operate the grid in an integrated manner promoting reliability, efficiency and economy in conformation to the desired security standards.

These procedures shall be maintained and reviewed periodically. However, in case of urgent need arising due to operating problems, the procedures can be reviewed / revised expeditiously. SLDC will be the coordinating agency for updating/review of internal Operating Procedures. All modifications/reviews will be done with the consent of all concerned in the state.

The internal operating procedures of CG state grid have following structure:

A. CHAPTERS

1. Black Start Procedures
2. Load shedding procedure.
3. Islanding procedure.
4. Outage Planning
5. Events reporting
6. Backing down of generation
7. Scheduling & Despatch

B. ANNEXURES

- I) Survival power & start-up power required for various state owned thermal station.
- II) Flow Charts for Black start from Bango HPS, MP, Eastern, Northern & Southern region.
- III) Directory of officials involved the black start & grid restoration in CG.
- IV) Format for maintaining Backing down register
- V) Format for maintaining manual Load shedding register
- VI) Format for maintaining A/B/C messages
- VII) Crisis Management documents

GENERAL

1. Operational Areas of Importance:

The following areas needs careful implementation by all the concerned / Power System Users:-

In case of a 2-bus system, at any sub-station, it must be ensured that the segregation of feeders on the different buses is uniform. It would help in minimizing the effect on the system in case of a bus fault.

- i) In 400kV substations having one and half breaker scheme, it must be ensured that the two buses at such substation remain connected at least by two parallel paths so that any line / bus fault does not result in inadvertent multiple outages. In case any element, say a line or an ICT or a bus reactor, is expected to remain out for a prolonged period at such substation, the main and tie breakers of such elements should be closed after opening the line side isolator. This should be done after taking all suitable precautions to avert inadvertent tripping.
- ii) The substation operators must ensure the above condition even when any lightly loaded line is opened to control high voltage. Such opening of lines is generally superimposed over other line outages on account of faults created by adverse weather conditions resulting in reduced security of the system.
- iii) Single pole auto reclosure facility on 765 and 400 kV lines should always be in service. WRLDC shall be informed before taking this facility out of service, for any reason. Likewise, in case any transfer breaker at any 765 kV/400kV substation having two main and transfer bus scheme is engaged, the same would be informed to WRLDC.
- iv) In order to damp out the low frequency oscillations in the system, the power system stabilizers on the generating units above 100 MW capacities shall be tuned by the owner as per a plan prepared by the Central Transmission Utility (CTU)/ WRPC. At present PSS Tuning is carried out as per WRPC approved plan for 210 MW units and above.
- v) All Intra state User /entities would endeavour to operate the connected generation and reactive power management devices such as Capacitors, Reactors, Synchronous Condensers, Fixed Series Capacitors (FSCs), Static Var Compensators (SVCs), TCSCs etc in a manner which enables stable

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voltage behaviour at various points of the grid under different operating conditions.

- vi) All Intra state User /entities would also maintain in good operating conditions of all control measures such as defence mechanism, SPS, U/F & U/V load shedding, AVR, PSS, RGMO, Operating reserves, emergency back-up power supplies etc., and ensure that the operational security standards are maintained for reliable and secured operation of the interconnected system.
- vii) In line with sections 5.2(f), 5.2(g) 5.2(h) and 5.2(i) of the IEGC, the generators to ensure generating units comply with the provisions. The list of RGMO eligible units as per the IEGC 5.2 (f) is at Annexure-VII
- viii) Switching Diagrams:
One copy of switching diagrams of all generating stations (100 MW and above) and all substations of 765 KV and 400 KV, important 220 KV and 132 KV, especially those involved in the evacuation of generation shall be kept at concerned SLDCs, WRLDC, CPCC and WRPC Secretariat to enable to co-ordinate the system operation, outages, system restoration and operational analysis. The same shall be updated from time to time.

2. Recording Instruments, Voice and Communication Facilities:

- i) The recording instruments such data acquisition system, disturbance recorder, event logger, fault locator, time synchronization equipment, voice recorder and any other such equipment in each generating station / sub-station / control centre / SLDCs / WRLDC shall be kept in good working condition in order to record the events and sequence. All such places shall have a common time reference whose authenticity shall be ensured by periodic verification and validation procedure to be developed and monitored by WRPC Secretariat.
- ii) Each regional constituent shall provide adequate and reliable communication facility internally and with other constituents / RLDC to ensure exchange of data / information necessary to maintain reliability and security of the grid. All the agencies shall provide systems to telemeter power system parameters such as power flow, voltage and status of switches/transformer taps etc., in line with interface requirements and other guidelines made available to RLDC / SLDCs at least before the date of commercial operation of the generating stations or substation/line being connected to the ISTS.

- iii) In line with Central Electricity Authority (Technical Standards for Connectivity to Grid) Regulations 2007, 6(3), the requester and user shall provide necessary facilities for voice and data communication and transfer of online operational data such as voltage, frequency, line flows and status of breaker and isolator position and other parameters as prescribed by the appropriate Load Dispatch Centre and agree to maintain the communication system in good condition.
- iv) In line with Central Electricity Authority (Technical Standards for Connectivity to Grid) Regulations 2007, Part-I,(7), every generating station and substation connected to the grid at 220kV or above shall be provided with disturbance recording (DR) and event logging facilities. All such equipment shall be provided with time synchronization facility for common time reference.
- v) For a high degree of service reliability under normal and emergency operation, at least one main telecommunication channel with an alternate backup channel shall be provided.

3. Operating Manpower:

The Control Centres of SLDCs and Sub SLDCs, Power plants, grid substations (above 33KV), as well as any other control centre shall be manned / monitored round the clock by qualified and adequately trained manpower who would remain vigilant and cooperative at all the times so as to maintain safe and secure grid operation.

4. ¹ [Definitions:

In these operating procedures unless the context otherwise requires:

- 1. **"Act"** means the Electricity Act 2003 (36 of Act 2003), including amendments thereto;
- 2. **"Apparatus"** means the electrical apparatus and includes all machines, fittings, accessories and appliances in which conductors are used.
- 3. **"Automatic Voltage Regulator "(AVR) "** means a continuously acting automatic excitation system to control the voltage of a generating unit as measured at the generator terminals;
- 4. **"Backing Down"** means the instructions of SLDC or WRLDC conveyed through SLDC, for reduction of generation of a generating unit under abnormal conditions such as high frequency, low system demand or network constraints;

¹ Definitions Added in Rev -03

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5. **Beneficiary**" means a person buying power from SGS, ISGS, InSGS using STU and/or CTU and/or transmission licensees' network and who have Transmission Service Agreement with the STU /Transmission Licensee/CTU.
6. **"Black Start Procedure"** means the procedure necessary to recover the grid from a partial or total blackout; **"Breakdown"** " means an occurrence relating to equipment of supply system which prevents its normal functioning;
7. **"Bulk consumer"** means a consumer who avails supply at voltage of 33 KV and above through open access;
8. **"Commission" or "CSERC"** " means the Chhattisgarh State Electricity Regulatory Commission;
9. **"Connection point"** means a point at which a user's and/or generating plants apparatus connecting to the intra-State transmission system;
10. **"Connection Agreement"** means an agreement between STU, intra-state transmission licensee other than STU (if any) and any person setting out terms related to a connection to and / or use of intra-state transmission system.
11. **"CSPTCL"** means Chhattisgarh State Power Transmission Company Limited acting as State Transmission Utility (STU).
12. **"Demand"** means the demand of active power MW, reactive power MVAR and apparent power MVA of electricity unless otherwise stated;
13. **"Data Acquisition System"** means a device provided to record the sequence of operation in time, relays/equipments/ system parameters at a locations;
14. **"Df/dt Relay "** means a relay which operates when the rate of change of system frequency (over time) goes higher than a specified limit and initiates load shedding ;
15. **"Dispatch Instructions"** means an instruction by SLDC to Intrastate open access generators/SGS (other than CGP and interstate open access generators) to dispatch generation and to distribution licensee/intra state open access customer to regulate drawal in accordance with the Scheduling & Dispatch procedure of Grid Code;
16. **"Distribution Company (Discom) "** means a company engaged primarily in the business of distribution and supply of electricity in its area of supply and licensed to do so under Section 12 of the Act;
17. **"Distribution System"** means the system of wires and associated facilities between the delivery points on the transmission lines or the generating station connection and the point of connection to the installation of the consumers.

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18. **"Despatch Schedule"** means a State Generating Station / InSGS scheduled to be exported to the grid from time to time.
19. **"Drawal Schedule"** means the submission of the station-wise ex-power plant drawal schedules from SGS / InSGS and drawal from state grid consequent to intra-State open access transaction.
20. **"Drawal"** means the electricity taken out from the intra state transmission system.
21. **"Event"** means a unscheduled or unplanned occurrence in the intra State Transmission system including faults, incidents and breakdowns;
22. **"Generating Plant"** means a generating station which shall include a captive generating plant (CGP); connected to state grid and includes a generation plant /CGP coming under the control area of SLDC as per provision of IEGC;
23. **"Grid Code"** means Chhattisgarh State Electricity Regulatory Commission (State Electricity Grid Code) Regulation, 2011 ²[and or its amendments from time to time].
24. **"High Tension (HT)" or "High Voltage (HV)"** means voltage higher than 650V but which does not exceeds 33 KV under normal conditions.
25. **"Indian Electricity Grid Code" or "IEGC"** means the central grid code specified by the Central Commission in accordance with sub section 1(h) of Section 79 of the Act.
26. **"Inter-State Generation Station" or "ISGS"** means a Central generating station or other generation station in which two or more states have shares;
27. **"Intra State generating Station" or "InSGS"** means any generating station including Captive generating plant (CGP) which is only connected to State grid;
28. **"Intra State Transmission System" or "State Transmission System" or "InSTS" or "State grid"** means any system for conveyance of electricity by transmission lines within the area of the state and includes all transmission lines, sub-stations and associated equipment of transmission licensee of the state;
29. **"Intra-State user"** means a person such as a generating company including captive generating plant or transmission licensee (other than CTU and STU) or distribution licensee or bulk consumer including captive user whose electrical plant is connected to the State grid at voltage level of 33 KV and above.

² To have the affect of the applicable Grid codes

- 30. **"Maximum Continuous Rating" (MCR)** means the normal rated full load MW output capacity of a generating unit, which can be sustained on a continuous basis at specified conditions;
- 31. **"Operation"** means a schedule or plan action related to the operation of a system;
- 32. **"Planned Outage"** in relation to a ³[InSGS] unit means outage of power station equipment and in relation to transmission facility means outage of transmission lines and equipments, which have been planed and agreed with SLDC in advance, during a year;
- 33. ⁴**[Pooling Station]** means the sub-station where pooling of generation of individual wind generators or solar generators is done for interfacing with the next higher voltage level:

Provided that where there is no separate pooling station for a wind / solar generator and the generating station is connected through common feeder and terminated at a sub-station of distribution company/STU/ CTU, the sub-station of distribution company/STU/CTU shall be considered as the pooling station for such wind/solar generator, as the case may be].

- 34. **"State Load Despatch Centre" or "SLDC"** means the centre established under sub-section (1) of section 39.
- 35. **"State Generating Station" or "SGS"** means any the generating stations owned by the companies owned or controlled by the State Government;
- 36. **"State Transmission Utility" or "STU"** means the Government Company specified as such by State Government under sub-section (1) of Section 39 of the Act.
- 37. **"Supervisory Control and Data Acquisition" or "SCADA"** means the combination of transducers, remote terminal unit communication links and data processing systems which provides information to the SLDC on the operational state of the State transmission system;
- 38. **"Time block"** block of 15.00 or 30.00 minutes during which energy meter records specified electrical parameters. For recording of MD in MW or MVA the measurement during the time block may be either on block interval or on sliding window principle].

³ (Rev-03) To align the definition with the CSEGC 1.3 (58).

⁴ (Rev-03) CERC Notification No.L-1/18/2010-Dated 06.01.2014; Second Amendment to IEGC-2010.

CHAPTER – 1: BLACK START FACILITY

1.0 Black Start Recovery Procedure

1.1 Scope

This document describes the procedures to be followed / implemented by SLDC, for the restoration of grid following a system disturbance and being issued in pursuance to clause 5.1 (3) “Operation Policy”, of Chhattisgarh state Electricity Grid Code -2011.

In accordance to the provision of the regulation 5.9.1 of CSEGC-2011 the detailed plans and procedures for restoration of the grid under partial / total black out shall be developed by SLDC in consultation with all intra-State users and shall be reviewed / updated annually.

1.2 Objective

To achieve restoration of total power system in the shortest possible time through

- Generation securing (i.e., stabilization of saved units)
- Extension of start-up power to thermal and nuclear units, restoration of traction and other essential loads, core sector industrial loads keeping in view of the generator capabilities and the transmission constraints etc.
- To achieve re-synchronization of the sub-systems/islands which have separated out from each other as a result of the disturbance in the system.
- It shall be the responsibility of the SLDC for preparing the list of such generating units having the black start facility ⁵[with the Bango / Black start generating facility stations].

1.3 Black Start Capability

Black start is the ability in respect of a black start station, for at least one of its generating units to start-up from shutdown and to energize a part of the system and to be synchronized to the system under instructions without an external power supply. It can also be termed as a process to recover or re-energize a system from total or partial failure.

⁵ Added in Rev -03

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For black start of an electrical power system we need to have generating units with black start capability. A black start unit is defined as a generating unit that is able to start without an outside electrical supply or the demonstrated ability of a base load unit to remain operating, at reduced levels, when automatically disconnected from the grid.

For a unit to qualify as a black start unit it must satisfy the following performance criteria

- i) A black start unit must have the capability of closing its circuit breaker to a dead bus upon request.
- ii) It must have the capability to maintain frequency under varying loads.
- iii) It must have the capability to maintain voltage under varying loads.
- iv) It must be able to maintain its rated output for a given time (as decided by the system).

1.4 System Restoration Approaches

Restoration of the system on black start is generally done through the following two approaches:

- A. Bottom Up Approach ; and
- B. Top-Down Approach.

1.4.1 Bottom-Up Approach

Systems with a fair dispersal of generating units with black start facilities:

Those generating stations, where black start facilities are available, should be started up and islands be formed around them by connecting essential loads. These islands are then interconnected at predefined locations where synchronizing facilities are available. The speed of restoration enhances with increase in number of black start facilities and their dispersal.

Chhattisgarh state has the only hydel generators at Bango with black start facilities from where start up can be extend to (4x50MW) units at Korba East Thermal power station by creating island between KTPS & Bango HPS through 132KV Jamnipali sub station.

Utmost care should be taken, while adding loads, to ensure step-by-step addition, keeping strict vigil of the load characteristics, i.e. variation of load with respect to

voltage and frequency and stiffness of the islands. Essential loads can be restored in steps smaller than 2-3 MW.

In all cases, load pick up should be restricted so as to avoid frequency excursions by more than 0.5 Hz in the island.

1.4.2 Top-Down Approach

Systems with no / less generating units with black start facilities:

The second approach could be followed in case self start facilities are available at only a few power stations or the start up power has to be imported from neighbouring areas/regions at one or two points.

In this case, the start up power is required to be extended to all the generating stations on priority basis while restoring few loads and transformers/reactors for voltage control.

Great deal of care has to be exercised while restoring the grid and the following guidelines must be kept in mind while restoration of a collapsed system:-

(i) Active/Reactive Power Balance:

- a) Load Restoration in small steps keeping in view the load characteristics keeping the system voltage within the allowable range.
- b) Load connected should preferably be balanced in all three phases.
- c) By-passing Under Frequency (U/F) relays until sufficient loads are connected.
- d) Minimum number of lines and those of shortest length to be charged to avoid high voltage (priority to be given to lower voltage lines)
- e) All possible reactive resources viz. Synchronous condensers, Reactors, HVDC filter banks etc) to be optimally utilized for voltage control.
- f) Paying special attention for traction and other fluctuating loads.

(ii) Communication/Co-ordination:

- a) Prompt communication and co-ordination between NLDC/RLDCs /SLDCs, Generating stations and major substations are inevitable during black start.
- b) Sufficient redundancy to be ensured in availability of communication channels.

- c) BSNL, MTNL and private landline and mobile networks are useful alternatives to PLCC channel, especially during disturbance. The contact numbers of all the concerned officials are to be essentially maintained in the Control Rooms and updated regularly. Internet (e-mail) also is to be used as a backup communication.
- d) All Major Control rooms must have at least three independent service Providers. There is good possibility that few networks may not be working and if working they may be congestion / jammed at that time.
- e) Apart from operating personnel at SLDC, availability of personnel responsible for real time data and communication is also important.
- f) Availability of back up power supplies in the form of batteries, battery chargers, and DG sets are to be ensured to avoid non-operation of circuit breakers, communication systems etc., since this may cause unnecessary delay in restoration of the system.
- g) All Generating and major substations shall ensure that DG set is always in fine Working conditions. Their healthiness shall be checked once in a week. Also ensure that sufficient quantum of Diesel is always available so that it can support for at least 10 Hrs.

1.5 Survival Power:

Survival power means power required for avoiding damage to the equipment in case of supply failure. As a general rule, the survival power requirement would be around 0.25 – 0.3% of the unit capacity. This power is mainly required for:

- Turbine emergency oil pump
- Jacking oil pumps
- Barring gear of the turbine
- Lubricating oil pumps
- Compressors for ABCB operation
- Emergency lighting
- Battery chargers of Units, Stations, Communication & Telemetry system.

The survival power & start-up power required for various state owned thermal station is enclosed in **Annexure-I**

1.6 The start-up power:

The start-up power is the power required for the unit auxiliaries for restoration of the generating unit. The requirement of start-up power for thermal units is generally 7 to 8% of the unit capacity and for hydel unit is about 0.5 to 1% of the unit capacity.

1.7 Operational Guidelines:

- i) All generating unit of CG, will coordinate synchronization of units and transmission lines in consultation with SLDC. SLDC will coordinate interstate/ inter-regional start up power availability and also interstate/ inter-regional synchronization of the system with WRLDC.
- ii) Priorities for usage of Black start generation are as under:-
 - a) Providing start up power to hot units
 - b) Restoring station auxiliary service to generating stations and Substations.
 - c) Picking up essential loads.

1.8 Restoration Procedures for CG System:

Regulations 9.1.1 of the CSEGC-2011 specifies to define the responsibilities of all the intra-state users for achieving the fastest possible recovery of the grid in the event of a failure in the transmission system, or any sudden loss of Generation or a blackout caused due to the failure of the Western Grid.

All hydro stations should compulsorily have Black start facilities and all EHV substation at 220 kV and above should have synchronizing facilities to meet the contingency.

During the blackout procedure to be adopted for fast recovery shall take into account the following:

- i. The possible transfer of power from the neighboring System through Inter State transmission lines,
- ii. The extent of immediate availability of power from the Central Sector generating stations and the generating plants.
- iii. Availability of power from any embedded generator connected to state grid

1.8.1 From Chhattisgarh's own sources

Black start facility is available in 3x40 MW Hasdeo Bango Hydel Power station through 250KVA DG set. Alternative start up power from 1500KVA DG set at Korba East (PH-I) can be availed through 3.3/132KV transformer.

After the LILO of 132 KV Korba East- Bango line at Jamnipali, the startup power from Bango has to be routed through Jamnipali as such utmost care

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has to be taken at Jamnipali substation for extending power to Korba East from Bango in emergency. A single line Grid diagram for Black start from Bango HPS to KTPS, Korba East is enclosed in **Annexure –II (A)**.

In the event of grid failure, for providing start up power to Korba East Power station from Hydel station of Hasdeo Bango following steps are to be followed at different stations :-

- i) At Bango 132 KV s/s :
 - a) Open the breaker of 132 KV Manendragarh, 132KV Bishrampur, 132 KV VESPL ⁶] and all 33 KV feeders except station supply, at Bango end.
 - b) Keep 132KV Bango-Jamnipali feeder in 'ON' condition.
- ii) At Jamnipali Sub-station:
 - a) Open the 132 KV breakers of VESPL, 132 KV Gevra, 132 KV incomer from ACBIL Chakbura, 132 KV Korba East circuit no.1
 - b) Open all 33 KV side breakers except station supply.
 - c) Keep 132 KV Jamnipali – Korba East circuit no.2
- iii) At Korba East 132 KV Sub-station:
 - a) Open the breakers of both 132 KV Champa and 132 KV Bilaspur circuits and both auto transformers.
 - b) Keep the Jamnipali circuit no.2 in 'ON' condition.
 - c) Keep the only 33KV feeders in service which are required for extending supply to PH-II and other important area inside the plant.

⁷**Alternatively:** In case of non-availability of 132 KV Bango-Jamnipali KV lines due to any reasons, possibility of extending start-up power from Bango Hydel power Station to Korba East via 132 KV Manendragarh – KotmiKala and 220 KV KotmiKala- Korba west needs to be explored.

This is a general concept for speedy restoration; however the station in charge may decide the best suitable option as per the prevailing real time situation

⁶ (Rev -03) Word “and 132 KV Gevra tapping” deleted since the Gevra s/s is now connected directly with the CSPTCL substation.

⁷ Added in first submission Vide SLDC letter No 1484 Dated 18/10/2013.

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while choosing the path for extending start up power to Korba East from Bango HPS.

1.8.2 From Madhya Pradesh State

Start up power from Madhya Pradesh through 220 kV Anuppur - Kotmikala - Korba West

OR

From VSTPS through 400 KV KSTPS - Korba West S/C line.

1.8.3 From Eastern region

Start up power from Eastern Region through 220 kV Budhipadar -Korba (E) path, 220 kV Budhipadar – Raigarh

OR

Through 400 KV Rourkela - Raigarh PGCIL - 220KV Raigarh PGCIL – 220 KV Raigarh - 220 KV Korba East paths

OR

Through 400 KV Rourkela - Raigarh PGCIL - 400KV Raipur PGCIL - 400KV KSTPS - 400/220 KV Korba west paths

1.8.4 From Northern region

Through VSTPS HVDC

Korba (E), DSPMTPS and Korba (W) will avail power from KSTPS.

400 KV VSTPS - 400 KV KSTPS - 400 KV Korba West - 220 KV Korba East - DSPMTPS

1.8.5 From Southern region

Through AC By pass link at Bhadrawati HVDC Back-to-back.

400KV Bhadrawati – 400 KV Khedamara – 220 KV Siltara – 220 KV Korba East

OR

400KV Bhadrawati – 400 KV Raipur PGCIL - 400KV KSTPS- 400KV Korba West – 220 Korba East.

The Single Line Diagram of above scenarios is also enclosed in **Annexure-II (B), (C), (D), & (E)**.

CCB of Korba East and Electrical control room officials of Korba West and DSPMTPS, shall always keep an updated telephone directory of all the officials engaged in the Korba, Jamnipali, Bango and SLDC Raipur. A current directory of above is enclosed in **Annexure-III** which shall be updated regularly.

1.8.6 On Total Regional Blackout:

As per the provisions of the regulations **9.2 of CSEG-2011, on Total Regional Blackout:** In case of Total Regional Blackout, the recovery shall be as per the Black Start procedure prepared by WRLDC in consultation with all the constituents of western region. As these procedures are updated periodically, the last updated procedures shall be followed during the total regional blackout.

1.8.7 Communications & Other responsibilities:

The intra-state users shall endeavor and agree to these 'black start' procedures and inform promptly to the SLDC:

Regulation No	Responsibilities	Action
9.4.1	The SLDC shall maintain a record of Generating plants with black start capabilities and Black Start operation plans.	The Intra State Users shall submit their black start capabilities and Black Start operation plans Details within 30 days from the date of issue of this operating procedure
9.4.2	The intra-state users shall agree to these 'black start' procedures and inform promptly to the SLDC whenever they have difficulty.	Provide the Intra state User has shared the details and plans with SLDC, CSPTCL for the same
9.4.4	The distribution licensees shall be responsible for sectionalizing the distribution system into discrete, unconnected blocks of load. They shall advise the SLDC as to the quantum of load likely to be picked up by the plants being synchronized.	The distribution licensees shall submit their plan within 30 days from the date of issue of this operating procedure

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- (i) In accordance to the regulations 9.5.1 of the CSEGC -2011, during the process of restoration of the transmission system, or regional system blackout conditions, the normal standards of voltage and frequency need not be applied, and left to the discretion of the SLDC as it considers appropriate depending on the prevailing situation.
- (ii) To comply with the regulations 9.5.3 of the CGSEGC-2011 all intra-state users shall pay special attention in carrying out the procedures to prevent secondary collapse of the system due to haste or inappropriate loading.
- (iii) As per the regulations 9.5.4 of the CSEGC-2011 despite the urgency of the situation, careful, prompt and complete logging of all operations and operational messages shall be ensured by all the intra-state users to facilitate subsequent investigation into the incident and the efficiency of the restoration process. Such investigation shall be conducted promptly after the incident, and SLDC shall place before the State Grid Coordination Committee for appraisal in its next immediate meeting.

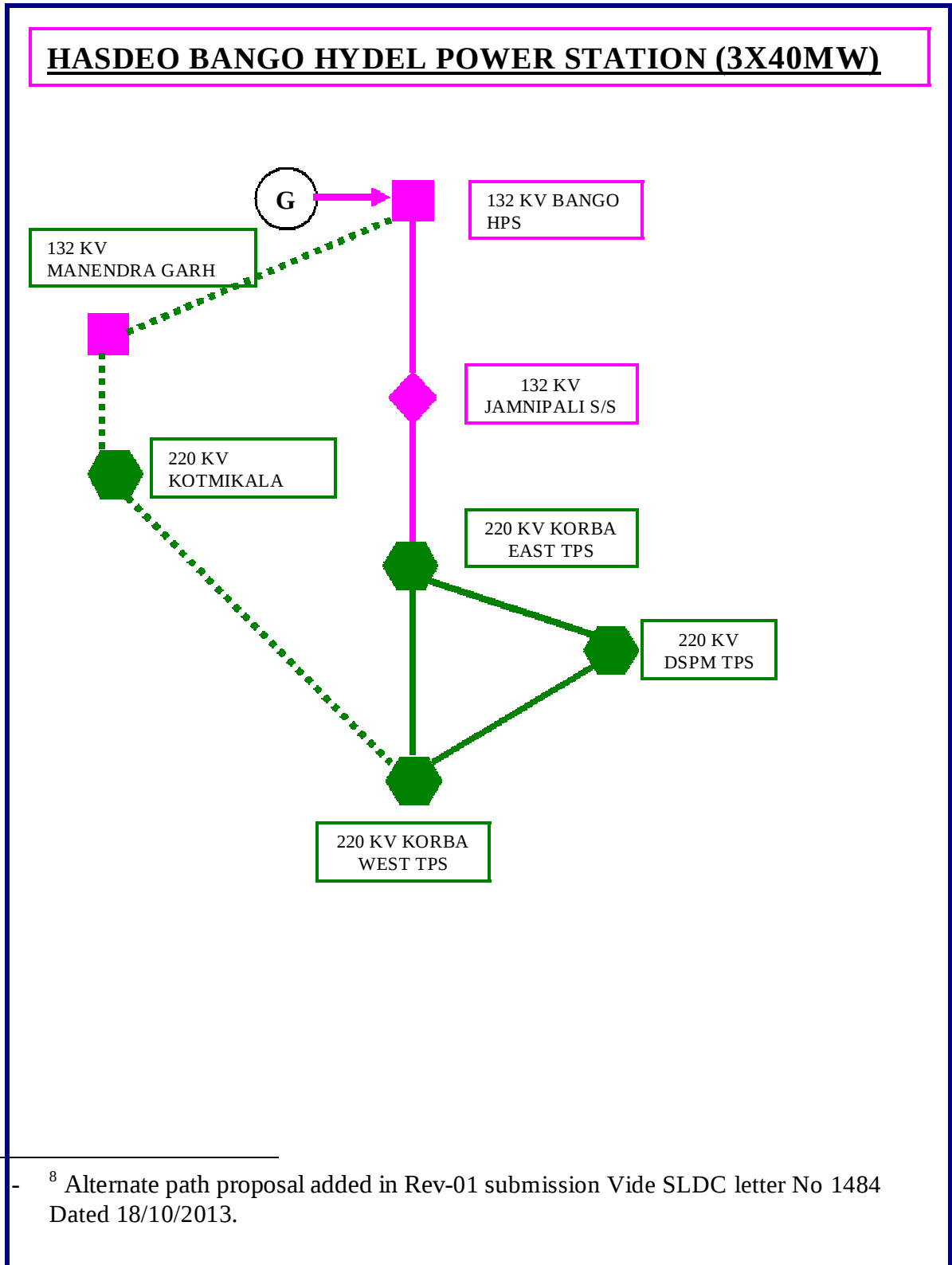
ANNEXURE-I

MINIMUM SURVIVAL AND AUXILIARY POWER REQUIREMENT

MINIMUM SURVIVAL AND AUXILIARY POWER REQUIREMENT					
Power Station Installed	Capacity (MW)	Survival Power(KW)	Start-up/ Auxiliary Power(MW)	Diesel Generator Capacity(KVA)	Synchronising Facility
THERMAL					
Korba(E)-II	4x50	381.70	4.000	1500 at old PH-I	Manual
Korba(E)-III	2x120	50.0	5.318		
DSPMTPS,Korba	2x250		2x25	3x750	Available
Korba West	4x210	400	2x16	4x500	Auto/ Manual
Korba west Extn.	1x500				
HYDEL					
Hasdeo Bango	3x40	80	3x500KVA	250	Manual

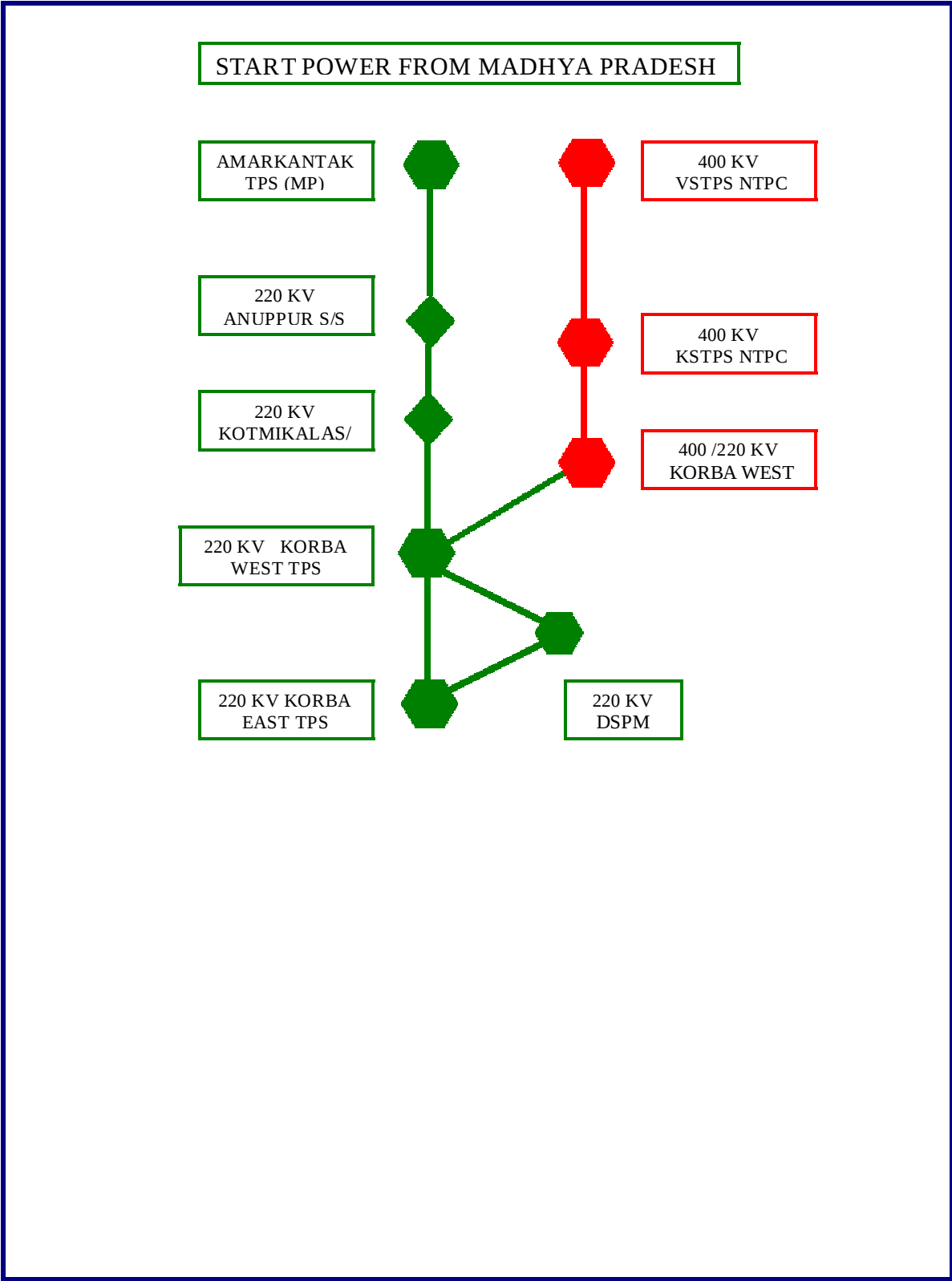
FLOW CHARTS – SYSTEM RESTORATION

1. FROM OWN BLACK START SOURCE

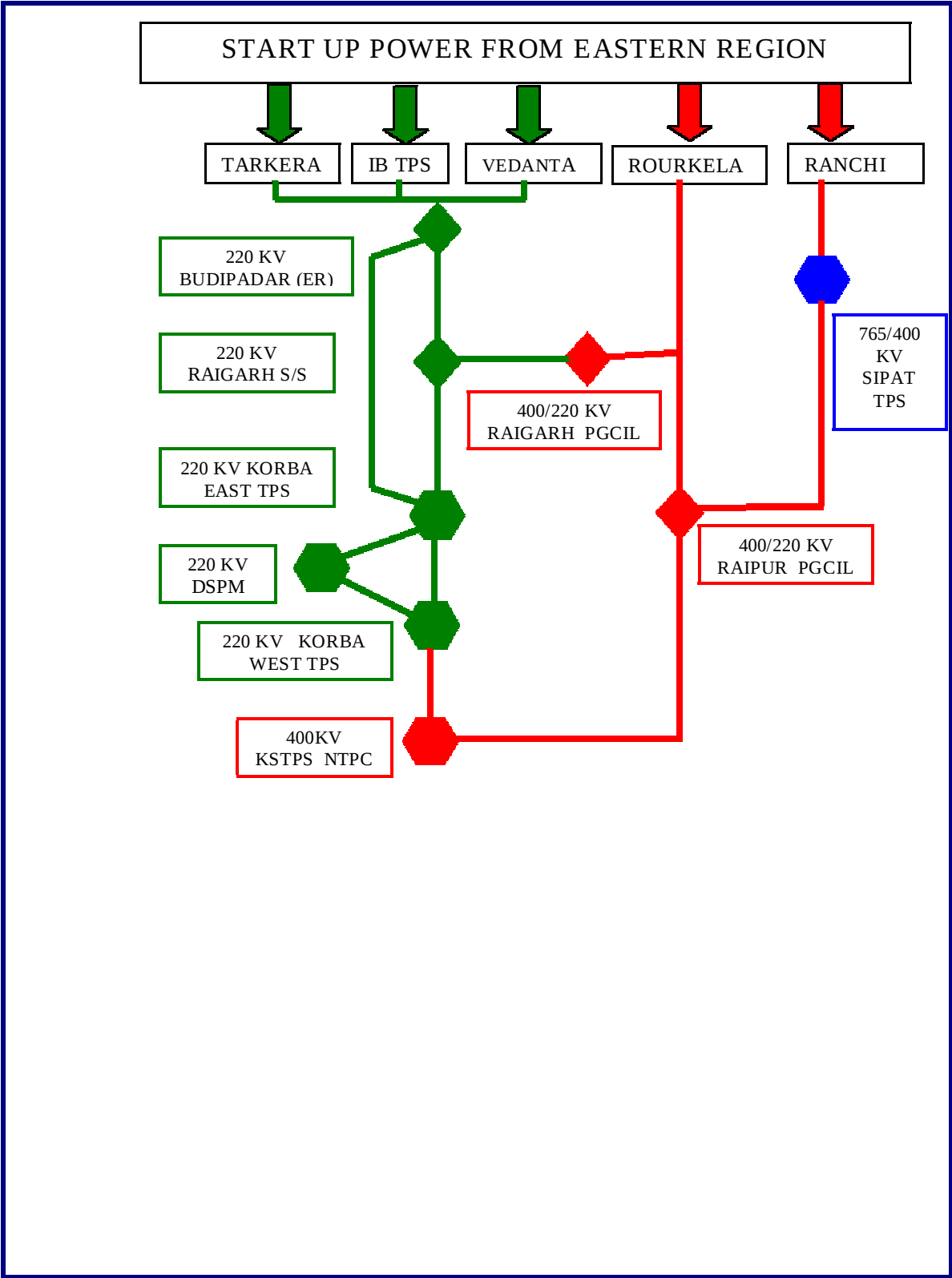


Annexure-II B

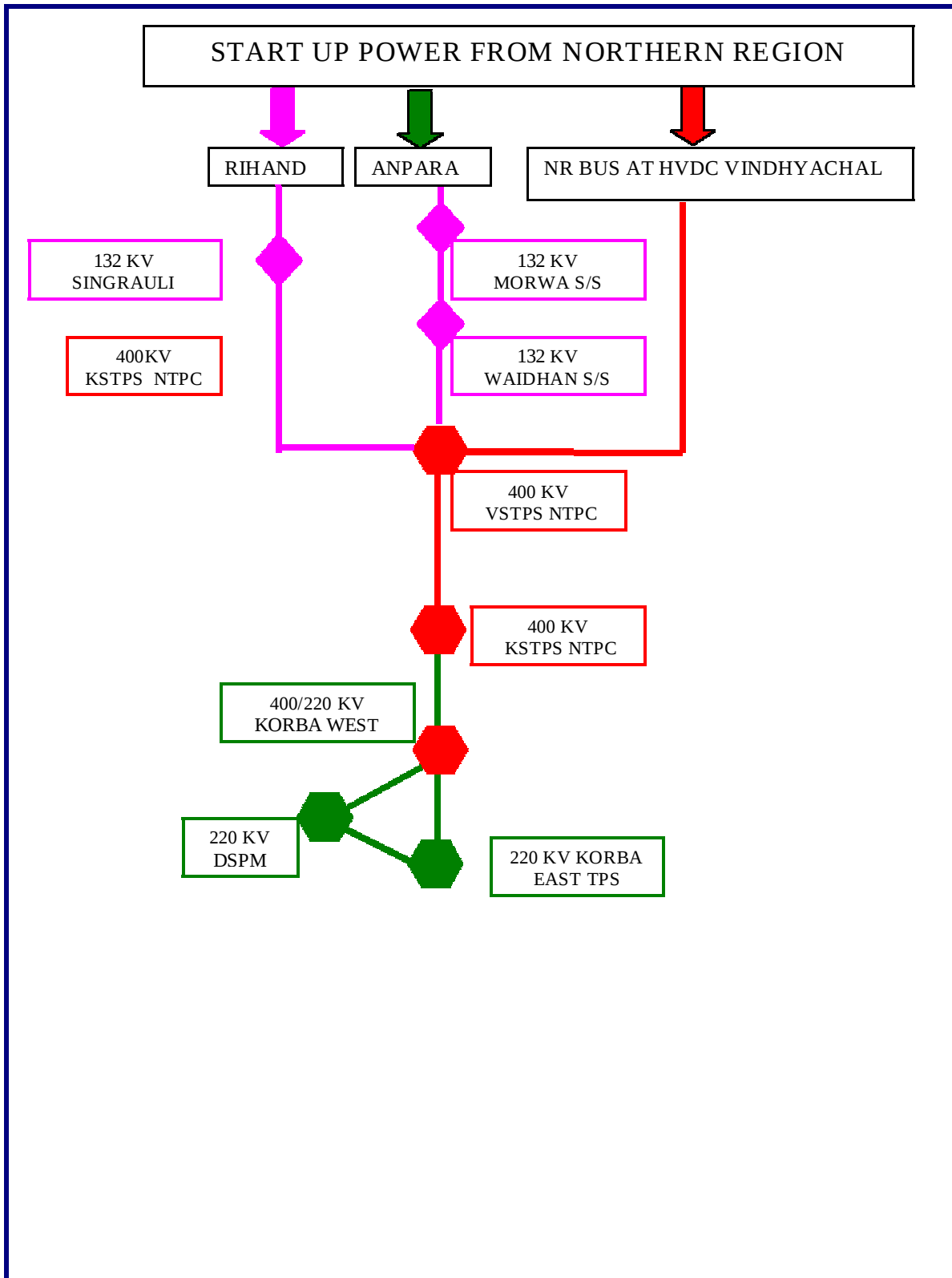
2. FROM MADHYA PRADESH STATE :



3. FROM EASTERN REGION

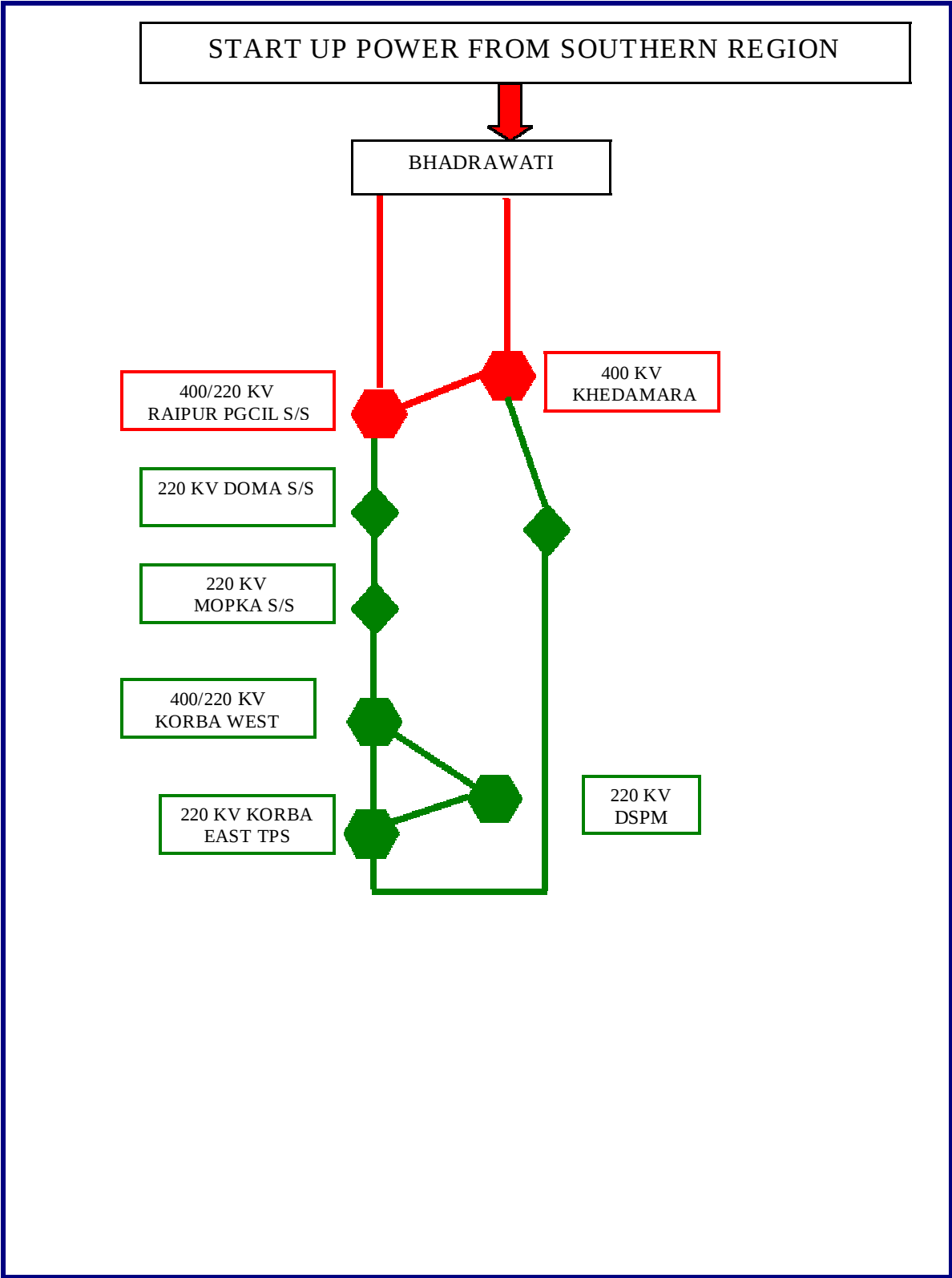


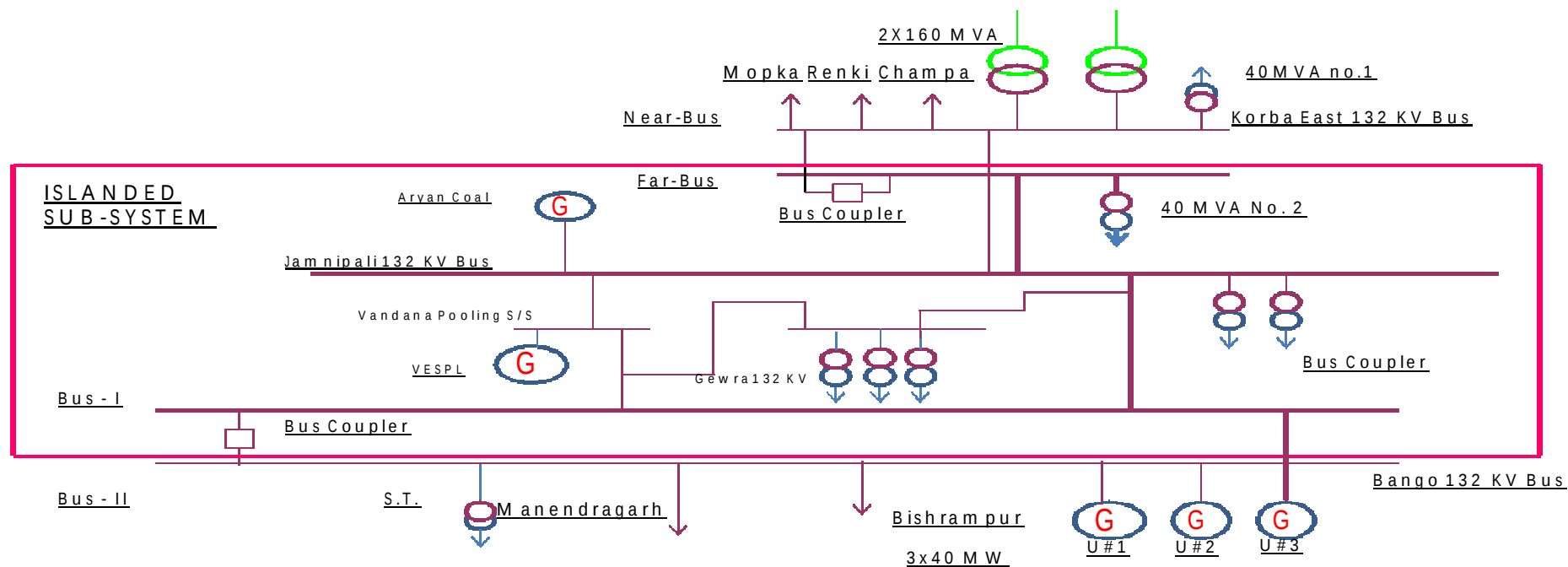
4. FROM NORTHERN REGION



- ⁹ NTPC KSTPS Station name corrected in Rev-01 submission Vide SLDC letter No 1484 Dated 18/10/2013.

5. FROM SOUTHERN REGION:





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Annexure-III

Directory of officials involved in Black Start & Grid Restorations in CG.

S.No.	Name Of Participants	Designation	Office	E-Mail ID	Tele No.	Fax No.	Contact No.
1	R.C.Choubey	CE (T&C)	ED(T&C), CSPTCL, Raipur		7712574256	7712574267	9424215447
2	K.S.Manothiya	E.D.(LD)	O/o CE(SLDC), Raipur	ksmanothiya@gmail.com	7712574172	0771-2574174	9826710989
3	Sharda Singh	C.E.(BR)	O/o CE(BR), CSPDCL, Bilaspur		07752427000	7752231655	9425392295
4	A.K.Saxena	ED (O&M:Gen)	Raipur		7712574421		9425540113
5	O.C.Kapila	C.E.(Gen)KWB	Korba		7759231444		9424171549
6	H.R.Narware	C.E.(O&M) CSPDCL	Raipur		2574901		9424024770
7	S.K.Banjara	C.E. (Gen)	CE(Gen.), KEB			7759221394	
8	Ashok Shrivastava	Addl. C.E.(O&M) KWB	Korba		7759236266		9424227412
9	Sandeep Gupta	S.E.(System Operation)	O/o CE(SLDC), Raipur		7712576012		9425160344
10	B.N.Biswas	S.E.	SE(ET& I-III) KEB	bn.biswas@cseb.gov.in			9479119001
11	S.K.Shrivastava	S.E.	SE(T&C), Bilaspur	setncbsp@rediffmail.com	7752427060		9425543157
12	V.K.Nimja	S.E.	O/o SE (O&M), Bango	vknimja@cseb.gov.in			9425227874
13	N.K.Bizora	S.E.(ET&I-I),KWB	SE(ET & I-I)KWB		7759231623		9407739777
14	A.P.Singh	S.E.(O&M), CSPDCL					9406440768
15	Y.K.Rao	E.E.	O/o CE(SLDC), Raipur	jkris22@yahoo.com			9425227874
16	Sanjay Chowdhery	E.E.	O/o CE(SLDC), Raipur	shubham.Choudhary@rediff mail.com			9479119001
17	S.S.Yadav	E.E.	SE(MP) Korba East	susingh1097@rediff mail.com			9425543157
18	S.N.Prajapati	E.E.	SE(ET&I-III), KEB	sn.prajapati@cseb.gov.in			9406440565
19	Manish Banchhor	E.E.	EE(MRT), Bilaspur	eemrt.bilaspur@cseb.gov.in			9526418820
20	S.S.Adhikari	E.E.	O/o SE(ET & I-1), HTPS KWB	ss.adhikari@cseb.gov.in			9893169898
21	G.P.Singh	A.E.	O/o CE (SLDC),Raipur	singhgp@sldccg.gov.in			9826881977
22	G.P.Rai	E.E.(Testing)	O/o SE(ET&I)				9425227905

CHAPTER – 2: LOAD SHEDDING PROCEDURE

This Chapter will be approved in due course after further deliberations.

CHAPTER – 3: ISLANDING PROCEDURE

- 3.0** All generators (including CGP) ¹⁰[in coordination with respective transmission licensee] will comply with the Clause 4.4.8 of the CSEGC-2011 and make adequate arrangement for isolation and islanding of their unit(s) in case of system distress conditions.
- 3.1** As per the Clause 4.4.18 of the CSEGC-2011 the Intra-state user shall take part in islanding and other grid schemes by contributing generation/ load wherever available, as decided by the SLDC, The applicant shall follow load restoration guidelines during islanded operation as per instructions of the SLDC.
- 3.2** All State entities shall ensure that the islanding schemes are functional and is not by-passed or removed without prior consent of SLDC.
- 3.3** As per the provisions of the clause 7.2.2 of the CSEGC -2011, STU shall comply the instructions and advices of WRPC regarding Planning of islanding and system split schemes and installation of under frequency relays and df/dt relays.
- 3.4** Further, STU shall also comply to the clause 7.2.3 of the CSEGC -2011, regarding installation of under-frequency relay for load shedding, relays provided for islanding scheme, disturbance recorder and fault locator installed at various sub-stations shall be tested and calibrated. The protection practices and Protocol Manual shall have provision for the same.
- 3.5** In Chhattisgarh state, presently no islanding scheme is in place. However a scheme for islanding of DSPMTPS unit along with loads of about 350-400MW under 220KV Suhela and Banari substations is under developmental stage. The same will be notified to all concerned and incorporated in this chapter as and when approved in WRPC forum & implemented. ¹¹[The islanding scheme shall be designed such that the feeder selections in the plan and that in the df/dt scheme do not conflict.]
- 3.6** The Intra-state entities having their islanding scheme should periodically check their islanding scheme functions and report their events to SLDC in case of the system split under frequency relay operation or over frequency relay operation. The details of their islanding scheme should be made available to SLDC.

¹⁰ Added in Rev-02 based on the discussions on 22/10/2013.

¹¹ Added in Rev-02 based on the discussions on 22/10/2013.

CHAPTER-4: OUTAGE PLANNING PROCEDURE

4.0 With the fast expansion of transmission system and addition of generation, the outage planning is becoming complex day by day as such planning in advance is required for arrangement of shut downs for the purpose of maintenance. As such SLDC has considered it important to lay down a procedure for outage planning of transmission lines and transmission elements.

4.1 Generally the outages shall be classified under two categories:

- (i) Planned Outages;
- (ii) Emergency Outages

4.1.1Planned Outages:

- 1. Planning Responsibilities:** The SLDC is responsible for analyzing the outage schedule given by all State entities, preparing a draft outage schedule for next year ¹²[by September].
- 2. Review:** This next year's plan shall be reviewed by SLDC/STU on quarterly and monthly basis in coordination with all parties concerned.
- 3. Intimation of Outages:** The next year plan shall be intimated to all Intra-state user(s) for implementation as may be decided by STU.

4. Time line:

Activity	Time Schedule
The STU and generating plants shall provide the SLDC their proposed outage programs in writing for the next year	By the end of the month of August of the current year; CSEGC-2011 clause 5.8.3.1
SLDC shall come out with a Draft outage program for the next year	By the end of the month of September of the current year; CSEGC-2011 clause 5.8.3.2
STUs, transmission licensees, CTU, ISGS IPPs, MPPs and other generating stations shall provide RPC Secretariat their proposed outage programmes in writing for the next financial year	By 30th November of each year. (IEGC2010 clause 5.7.4.(b))
RPC Secretariat shall then come out with a draft outage programme for the next financial year taking into account the available resources in an optimal manner and to maintain security standards.	By 31st December of each year for the Regional grid. (IEGC2010 clause 5.7.4.(b))

¹² Replace “and establishment of final plan for current year by July of current year” with “by September” in Rev 02, Based on the discussion in the meeting 22/10/2013

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Activity	Time Schedule
Intimation to all Intra-state user(s) for implementation of the outage Plan by STU	Latest by the end of the month of January CSEGC-2011 clause 5.8.3.4
The RPC Secretariat shall be primarily responsible for finalization of the annual outage plan for the following financial year	By 31st January of each year. (IEGC 2010 clause 5.7.4.(a))

5. **Demand estimation:** Demand estimation is necessary for both long time scale to ensure adequate system plant margins and ratings and for short time scale to assist with frequency control. Discom shall provide to the STU their estimates of demand for the desired period on a year ahead, month ahead basis as required. Based on this, the STU shall make monthly peak and lean period demand estimates for the year ahead. STU shall use hourly generation summation figures and import/export figures to meet the demand estimation. Distribution companies shall provide to SLDC estimated load that may be shed, when required, in discrete blocks with the details of the arrangements of such load shedding. All data shall be collected in accordance with procedures agreed between the STU and each constituent. SLDC shall maintain a database of State demand on an hourly basis. (CSEGC -2011 clause 5.8.2.3).
6. **Planned Outages for the Construction of the Transmission Lines:** ¹³[For the inclusion of the shutdowns in the planned shutdown, all the shutdown proposals shall have consent of STU, T&C and EHT of the CSPTCL. In case of shutdowns of all by outside agencies on STU network and also those having connectivity with the EHV substation of the STU shall have the consent of CSPDCL and CSPTCL before submission to SLDC].
7. Such shutdowns shall not be treated under the emergency category.
8. As per clause 5.8.3.7 of the CSEGC-2011:- SLDC is authorized to defer the planned outage in case of any of the following:
 - i. Major grid disturbance;
 - ii. System isolation;
 - iii. Black out in system of any constituent; and
 - iv. Any other event in the system that may have an adverse impact on the system security by the proposed outage.

4.1.2 Emergency Shutdowns:

In case of emergency in the system viz. loss of generation, break down of transmission line affecting the system, grid disturbance, system isolation,

¹³ Para 4.1.1.6 Substituted in Rev-02 based on the discussions on 22/10/2013.

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SLDC may conduct studies again before clearance of the planned outage. (CSEGC 2011 clause 5.8.3.6).

4.2 AVAILING OF SHUT DOWNS

4.2.1 For transmission lines & elements at 400KV level within state and 220 & 132 KV inter-state :

1. The proposals for planned shutdown on all 400 KV, 220 KV & 132 KV interstate transmission lines and elements like ICT/reactors etc shall be availed only after obtaining approval in Operation Coordination Committee meetings (OCCM) held monthly by WRPC, Mumbai.
2. The shut down proposal for above lines/elements shall invariably be submitted to SLDC by 2nd day of the month, preceding the month in which shut down is required.

For example if any shutdown is planned for the month of MAY then the same has to be intimated to SLDC by 2nd APRIL so that the same is got included for approval in the OCC meeting of April month.

3. After the approval of proposed shutdown, it is the responsibility of the department who has applied for shut down, to intimate SLDC whether they are ready to avail the shutdown on the approved line/element, before 3 days of the day of shutdown.
4. For example, if the shutdown is approved by the WRPC on 25th may then the concerned department has to intimate to SLDC about availing the shutdown on 22 May so that the same can be intimated to WRLDC. With this procedure, not only the shutdown code can be obtained from WRLDC in time but also in case of non- availing of the approved shutdown, the shutdown proposal of other needy utility can be granted.

4.2.2 For transmission lines & elements at 220 & 132 KV level within state :

1. With the rise in demand and generation in the state, the transmission lines are getting loaded to their capacity especially in 220KV lines hence while permitting the shutdowns, SLDC has to undertake load flow studies and has to corroborate with the shutdowns approved in WRPC forum for 400 & 220 KV system.
2. In view of the above it has become necessary to have an internal procedure for the shut downs within state at 220 & 132 KV level.
3. The entire proposal for shutdown shall be routed and approved by the Chief Engineer (T&C), CSPTCL, before submitting to SLDC for implementation. All the formalities like consent of Railways or other state agency, and CSDPCL

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for load interruption, if any, shall be obtained by the authority proposing the shut down.

4. The office of CE (T&C) will make the system study and submit the final plan to SLDC.
 5. SLDC will again do the system study on the basis of real time condition before issuing code for shut down.
 6. The shut down will be allowed in real time by SLDC depending upon the prevailing grid condition. During the shutdown if any backing down of generation in CSPGCL ¹⁴[and or CCP/IPP] units is required due to transmission bottleneck then the same will be arranged by the office of CE(T&C) Raipur in consultation with Chief Engineer (O&M:Gen) CSPGCL, Raipur and CE(O&M) CSPDCL, Raipur
 7. The shut down proposal ¹⁵[of CSPGCL] and their switchyard routed through ED/ CE (O&M: Gen) CSPGCL, Raipur shall only be acceptable by SLDC, CSPTCL.
 8. In case of emergency shutdown SLDC may permit with telephonic approval of CE (T&C) and the Generating Plant Station Head ¹⁶[or on the basis of availability with the SE (T&C)/SE(ET&I) of the concerned circle or power station].
- 4.3** Each intra-state user shall obtain the final approval from SLDC prior to availing an outage as per clause **5.8.3.8** of the CSEGC-2011.
- 4.4** It shall be the mandatory of each and individual entity availing shutdown to obtain shutdown code on real-time basis from SLDC, CSPTCL control room, prior to the commencement of the shutdown.

¹⁴ Added in Rev-02 based on the discussions on 22/10/2013.

¹⁵ Replaced in Rev 02, "for Generating plant" with "of CSPGCL" base on the discussions on 22/10/2013

¹⁶ Added in Rev-02 based on the discussions on 22/10/2013.

CHAPTER – 5: EVENT REPORTING

5.1 ¹⁷ [The operational liaison function is a mandatory built-in hierarchical function of the SLDC and Intra-state user(s). SLDC exchange of information in relation to operations and / or events on the total grid system related to : (CSEGC-2011 clause 5.7)

- i. the State grid;
- ii. inter-State links; and
- iii. the system of intra-State entity.

To facilitate quick transfer of information this shall be published over the SLDC web site daily known to be Daily Performance Report (DPR). Formats of the reports that likely are the part of these reports are annexed as **Annexure-VI**. The aforementioned generally relates to what has happened. The frames, formats and the contents may change from time to time in order to meet the regulatory requirements, if any].

5.2 State Grid code – 2011, clause 11.1.1 to 11.1.3 stipulates that all events in the transmission system shall be notified by STU/ transmission licensee and intra state users whose system is affected, to SLDC. As per IEGC clause 5.9.4 & state grid code 11.2.6, SLDC is responsible for reporting events in line with procedure set in IEGC.

5.3 In view of the above, the time schedule for all intra state users for reporting incidents to SLDC is as given under:

- (a) All reportable incidents shall be immediately conveyed orally to SLDC by the affected substation, however the maximum time allowed is 15(fifteen) minutes from the time of the occurrences of the event (as per clause 11.2.5 of CSEGC -2011). The reason and likely time for restoration if any shall also be intimated.
- (b) A written confirmation to SLDC ¹⁸[preferably] within one hour of such oral report by FAX/e-mail.
- (c) If the reporting incident is of major nature, the written report may be submitted within two hours duly followed by a comprehensive report within 48 hours of the submission of the initial written report.
- (d) In other cases, the reporting intra-state user shall submit a report within five working days to SLDC.

5.4 Significant event includes such events having an operational effect e.g.

- (a) Tripping of plant and/or apparatus manually or automatically

¹⁷ Rev 03: DPR clause added.

¹⁸ Added in Rev-02 based on the discussions on 22/10/2013.

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- (b) Voltage outside statutory limits
- (c) System frequency outside statutory limits
- (d) System instability or
- (e) System overloads in the transmission system,

Typical examples of reportable incidents that could affect the transmission system are as follows:

- (a) Exceptionally high/low voltage or frequency,
- (b) Serious equipment problem i.e. major circuit breaker, transformer, bus bar fault,
- (c) Major problem in the generating unit,
- (d) Tripping of ICT, transmission line or capacitor bank, reactor.
- (e) Major fire incident, cyclones, storms earthquakes etc.
- (f) Major protection failure,
- (g) Over loading of equipment or transmission line which may result in hazard to the personnel,
- (h) Activation of any alarm or indication of abnormal operating condition,
- (i) Adverse climatic conditions being experienced or forecast,
- (j) Breakdown, or faults, or temporary changes in the capabilities of Plant and/or apparatus,
- (k) Impending risks of protection operation,
- (l) Loss of load,
- (m) Accidents,

5.4 The format for such a report shall typically contain the following:

- (a) Location of the incident,
- (b) Date and time of the incident,
- (c) Plant or Equipment involved,
- (d) Supplies interrupted and the duration wherever applicable,
- (e) Amount of Generation lost, wherever applicable,
- (f) System Parameters before and after the incident, (Voltage, Frequency, Flows, Generation etc.),
- (g) Network configuration before the incident,
- (h) Relay indications and performance of protection,
- (i) Brief description of the incident,
- (j) Estimated time of return to service,
- (k) Any other relevant information,
- (l) Recommendations for future improvement, and
- (m) Name and designation of reporting officer.

5.5 Reportable Events (Clause 5.10.2 of the CSEGC-2011)

Events effecting a generator capacity or a load of more than (200) MW shall be reported by State Load Despatch Centre along with brief detail of the event to the STU:

- (i) Violation of security standards.

- (ii) Operational Indiscipline.
- (iii) Non-compliance of instructions.
- (iv) System islanding / system black out.
- (v) State black out / partial system black out.
- (vi) Major protection failure.
- (vii) System instability.
- (viii) Tripping of any element of the EHV State grid.
- (ix) Major Equipment failure.

5.6 As per CEA regulations on Grid standards 2010,

- (a) "Grid disturbance" means tripping of one or more power system elements of the grid like a generator, transmission line, transformer, shunt reactor, series capacitor and Static VAR Compensator, resulting in total failure of supply at a sub-station or loss of integrity of the grid, at the level of transmission system at 220 kV and above.
- (b) "Grid incident" means tripping of one or more power system elements of the grid like a generator, transmission line, transformer, shunt reactor, series capacitor and Static VAR Compensator, which requires re-scheduling of generation or load, without total loss of supply at a sub-station or loss of integrity of the grid at 220 kV and above.

5.6.1 In the event of a grid disturbance, highest priority is to be accorded to early restoration / revival of the system. During restoration, it is possible that system may have to be operated with reduced security standards and under suspension of all commercial incentives / penalties. This chapter forms the guidelines for classifications of disturbances into different categories for the purpose of analysis and reporting.

5.7 Grid incidents and disturbances are also the major reportable events, the information are to be provided by SLDC in the prescribed format as provided in the IEGC and WRLDC operating procedures. Hence it becomes imperative for the Intra state user to provide all the major events and information desired to SLDC without prejudice and promptly.

5.7.1 Classification of Grid incidents and disturbances

As per CEA regulations on Grid standards 2010, the categorisation of grid incidents and grid disturbances shall be as follows:-

- (a) Categorisation of grid incidents in increasing order of severity,-
Category GI-1 - Tripping of one or more power system elements of the Grid like a generator, transmission line, transformer, shunt reactor, series capacitor and Static VAR Compensator, which requires rescheduling of generation or load, without total loss of supply at a sub-station or loss of integrity of the grid at 220 kV

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Category GI-2 - Tripping of one or more power system elements of the grid like a generator, transmission line, transformer, shunt reactor, series capacitor and Static VAR Compensator, which requires rescheduling of generation or load, without total loss of supply at a sub-station or loss of integrity of the grid at 400 kV

(b) Categorisation of grid disturbance in increasing order of severity,-

- **Category GD-1** - When less than ten per cent of the antecedent generation or load in a regional grid is lost;
- **Category GD-2** - When ten per cent to less than twenty percent of the antecedent generation or load in a regional grid is lost.
- **Category GD-3** - When twenty per cent to less than thirty per cent of the antecedent generation or load in a regional grid is lost;
- **Category GD-4** - When thirty per cent to less than forty per cent. Of the antecedent generation or load in a regional grid is lost;
- **Category GD-5** - When forty per cent or more of the antecedent generation or load in a regional grid is lost.

Explanation: For the purpose of categorisation of grid disturbances, percentage loss of generation or load, which ever is higher shall be considered.

(c) The information regarding disturbances may please be furnished in every OCC in the following format:

DETAILS OF ENERGY NOT SERVED DUE TO GRID DISTURBANCE
Utility/Control Area: _____

Date

Time of occurrence

Category

Black out at

Bus Restoration Time

Essential Loads/Traction affected Area in MW affected

Energy not supplied (MUs)

- 5.8** An oral warning shall be issued by SLDC and confirmed in writing as well, to the STU/transmission licensee and the intra-state users, who may be affected when SLDC knows that there is a risk of widespread and serious disturbance to the whole, or part of, the total system. Such messages / gist shall be made available by SLDC on its website within next 2-3 working day.

CHAPTER – 6: GENERATION BACKING DOWN PROCEDURE

- 6.01** ¹⁹["There should not be any reduction in generation in case of improvement in grid frequency below 50.05 Hz (for example, if grid frequency changes from 49.9 to 49.95 Hz, there shall not be any reduction in generation). For any fall in grid frequency, generation from the unit should increase by 5% limited to 105 % of the MCR of the unit subject to machine capability.]”
- 6.02** ²⁰[No over injection of electricity by a seller or generator shall be permissible when grid frequency is "50.10 Hz and above].
- 6.03** **"Backing Down"** means the instructions of SLDC or WRLDC conveyed through SLDC, for reduction of generation of a generating unit under abnormal conditions such as high frequency, low system demand or network constraints;- CSEGC-2011 clause 1.3.9.
- 6.04** All Intra-state users, distribution licensee or bulk consumer shall comply with direction of SLDC and carry out requisite load shedding or backing down of generation in case of congestion in transmission system to ensure safety and reliability of the system. :- CSEGC-2011 clause 5.4.1.(v)
- 6.05** The backing down of generation is generally required
1. In the event of load crash in the system due to weather or other reasons;
 2. High under drawl from the grid (more than ²¹[12]% of Central Sector Schedule subject to maximum 150MW);
 3. High system frequency (More than ²²[50.05] Hz);
 4. Transmission constraints in evacuation of power or congestion in the state grid (grid code-2011, clause 5.4.1.(v));
 5. Real time advice from WRLDC during critical contingencies in inter-regional corridors / flow gates’;
 6. To avoid imposition of congestion charges by WRLDC whenever responsible for congestion in inter regional & intra regional links/corridor (IEGC-clause 5.4.2 (h).

¹⁹ Rev-03: As defined by CERC in the 2nd amendment of the IEGC-2010 effective from 17th Feb 2014 or as notified by CSERC.

²⁰ Rev-03: Limits defined by CERC in Deviation & Settlement Mechanism -2014 effective from 17th Feb 2014 or as notified by CSERC.

²¹ Rev-03 Deviation Limits defined by CERC in Deviation & Settlement Mechanism -2014 effective from 17th Feb 2014 or as notified by CSERC.

²² Rev-03 Frequency operating band 49.90 Hz to 50.05 Hz as defined by CERC in the 2nd amendment of the IEGC-2010 effective from 17th Feb 2014 or as notified by CSERC.

6.06 The Backing Down Instructions (BDI) to the injecting utility shall be classified as under:-

6.06.1 When the injection is above the schedule and system constraint like frequency and or under drawl of the State persist in accordance to CERC DSM Regulations 2014 and its amendments, all the entities having excess injection w.r.t. their schedule has to bring down their injection immediately to the schedule.

6.06.2 When the system frequency is above ²³[50.05] Hz, the user for the grid injecting their power should bring down their injection to the level as instructed by SLDC that shall be applicable on percentage basis distributed proportionately. The relief of such BDI shall be available at SLDC within 2 time blocks counting the first block in which the instruction is issued.

6.06.3 In case there is substantial under drawl by the State and the under drawl of the State persist in accordance to CERC DSM Regulations 2014 and its amendments, the intra-state entities has to back down generation of the surplus quantum injected into the grid to their accepted schedule. This relief shall be available at SLDC within 2 time block counting the first in which the instructions have been issued.

6.06.4 Further, SLDC may advice the Regional entity (CSPDCL) to surrender their Costly power (as per the MOD) and get their schedule curtailed both at the State and the Regional level so that the widening gap between the Schedule and the drawal could be narrowed either on account of their under drawal or system over frequencies, as the case may be.

6.06.5 The backing down instruction on account of Congestion: The same shall be effective from the time of the message has been issued and till the congestion is relieved. For this the codes shall be issued by SLDC from the time when the congestion was observed and that congestion was released. In such case entities affected in the zone shall have to back down their injection to the quantity as instructed by SLDC.

6.06.6 The backing down instruction on account of Transmission constraints: The time block in which the instructions was issued the backing down shall be effective from the same time block. However, in such cases the actual injection shall be considered as the schedule till the transmission constraint is relieved.

²³ Rev-03 Frequency operating band 49.90 Hz to 50.05 Hz as defined by CERC in the 2nd amendment of the IEGC-2010 effective from 17th Feb 2014 or as notified by CSERC.

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6.07 BDIs Categories: - Generally the Backing Down Instructions (BDI) messages issued shall be having the categories as tabled below. It shall be the responsibility of the intra state entity to comply with it within the specified limits as indicated under clause 6.06. The message could be in single category or a combination of two or more category depending upon the system conditions on real time basis. More the categories include to it, the higher shall be the severity of the BDI message. The format of the BDI instruction/ notice is enclosed as **Annexure-IV A**. The types of BDI messages have been chronologically listed below (in descending order) based on its severity from highest to high.

Sr No.	BDI Type	Reason
I.	BDI- 1	High System Frequency (Freq ⁵⁴ [50.05] Hz)
II.	BDI-2	Substantial under drawl of the Chhattisgarh State. (> ⁵² [12%] of the Central sector schedule)
III.	BDI-3	Over injection of state entities against the approved schedule quantum. (>105% in any time block of the schedule)
IV.	BDI-4	Congestion in the network.
V.	BDI-5	Transmission Constraint.

6.08 The sequence of backing down of generation in the above mentioned conditions shall be as given under:

Ø ²⁴[Step-1: Lifting the load shedding/restrictions, if any].

Ø Step-2: All infirm power injections to be made '0' (zero);

Ø Step-3: All excess injection over and above the schedule by InSGS should be reduced to the schedule limit.

Ø Step-4: ²⁵[Such directions should immediately be acted upon]. Failing to it SLDC may opt for disconnection of their system through the respective substations.

Ø Step-5: Phasing out hydro generation, if any during that period, provided there is no system constraints like loading of KEB ICTs, down stream water requirement for irrigation and industrial purpose etc.

Ø Step-6: The other sequence of the backing down instructions shall be ; Short term open access under bilateral transactions, Medium Term Open Access under bilateral transaction,

²⁴ Step -1 scrolled down by step 4 in this place in Rev-02, based on discussions on 22/10/2013.

²⁵ Rev 03: Replaced confirmatory to clause 6.2.3 of CSEGC -2011 and CSPGCL observations.

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- Ø Step-7: Backing Down of Long term access transaction
 - o Backing down or closing down of SGS Generating units
 - o Putting request before WRLDC for the Backing down of CSGS/ISGS Generating units having share of the Regional entity of the state.
- Ø Step-8: Advising CSPDCL for arranging export of power to deficit states / regions through STOA under bilateral or collective transactions. [For it CSPDCL has to communicate the Name of Person/ Authority Designations, Fax No, Mobile No and other contact details to SLDC, CSPTCL]
- Ø Step-9: Once the BDI issued by SLDC, the entity has to back down as per the time period explained above. In case of No partial action or varying injection above the schedule by state entity, SLDC will have the option of disconnection at inter face point with CSPTCL grid.

6.09 BDI for Non- Conventional Energy (NCE) Power plants:

6.09.1 ²⁶[CSPDCL shall provide the list of the Bio mass & Must-Run plants. And ensure the updates to be provided to SLDC on quarterly basis. CSPDCL shall ensure at their end that these plants are not included in the group load shedding plan].

6.09.2 Bio-mass, small hydel, wind, solar and bagasse base power station installed in State and who are supplying power to any distribution licensee of the state shall continue to supply power as per orders of the Commission, in force. CSEGC- 2011 clause 6.12.

6.09.3 Since variation of generation in run-of-river power stations shall lead to spillage, these shall be treated as must run stations. All renewable energy power plants, except for biomass power plants, , and non-fossil fuel based cogeneration plants whose tariff is determined by the appropriate commission shall be treated as 'MUST RUN' power plants and shall not be subjected to 'merit order despatch' Principles IEGC 6.5.5.11.

6.09.4 Generally the Bio-mass plants may not be subjected to the BDI during the off-Peak Hours.

6.10 BDI for Intra State generating Station" or "InSGS":

²⁷□

²⁶ Add clause 6.07.01 in Rev-02 , and renumber the further clauses of the 6.07.02,...04 based on the discussions on 22/10/2013

²⁷ Rev 03: Earlier clauses no. 6.08.01 & 6.08.02 - Deleted as already covered in chapter A: General point 4 – Definitions.

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6.10.1 All generators (including CGP) will make adequate arrangement for isolation and islanding of their unit(s) in case of system distress conditions. CSEGC-2011 clause 4.4.8

6.10.2 The ²⁸ InSGS shall be required to demonstrate the declared capability of its generating station at the grid interface point, as and when asked by the State Load Despatch Centre. In the event of the intra-state user failing to demonstrate the declared capability, the capacity charges due to the generator shall be reduced as a measure of penalty. CSEGC -2011 Clause 6.17.

6.10.3 Accordingly, the scheduling at the interface point with the state grid shall be treated as the datum for all the activities for Backing Down Instructions. The entities whose installed capacity is not declared at the interface point with the grid for scheduling purpose, the quantum of backing down may be upto the 100% of the schedule at that point as it is deemed to be the surplus flow from the CGP.

6.10.4 In case of the ²⁹[InSGS] who has its entire capacity declared at the interface point with the grid for scheduling, the backing down priority shall be upto the technical limits of the generating units till it do not require the liquid fuel support. ³⁰[Presently the technical limits considerable are as below:-

Sr No.	Unit Capacity	Technical Limits	References (if any)
(i)	= 500 MW	40%	As decided in the WRPC forum.
(ii)	200/210 MW	30%	

For the Generating units of capacity lower than 200 MW the technical limit shall be considered as 30% of the installed capacity].

6.10.5 Provided all such entities should submit their details of the capacity and capability of their generators and other relevant documents to SLDC in order to get established their technical limit.

6.10.6 The SGS i.e Power stations of CSPGCL shall backdown up to the technical minimum on merit order and threshold frequency of stations.

6.11 Issuance of instructions:

6.11.1 SLDC control room will issue Backing down instruction (BDI) telephonically during real time operation through a code directly or through the CSPTCL sub

²⁸ Rev 03: Replace the words “SGS / InSGS Use” with “InSGS”.

²⁹ Rev 03: The word “InSGS” replaces the word “ entities SGS/ IPPS/ CPP”.

³⁰ Replacing “In general the technical limit is considered as 40% of the installed capacity” with the “Presently the technical limits considerable..... 30% of the installed capacity] in Rev-02.

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station where the generator is connected and all state user will comply with BDI.

6.11.2 SLDC will maintain a register in control room for keeping a record of BDI issued with reasons & remarks of compliance by shift engineers. The format of the register is enclosed in **Annexure-IV C**.

6.11.3 The BDI issued by SLDC shall also be displayed in the website of SLDC. In case of BDI on account of the Congestion in the network the same shall be made available by SLDC on its website **Annexure-IV B**.

6.11.4 All the intra-state users are responsible for submitting the up-to-date data in accordance with the provisions of the Grid Code. All the intra-state users shall provide SLDC/STU, the names, addresses, and the telephone numbers of the persons responsible for sending the data. SLDC/STU shall inform all the intra-state users the names, addresses and telephone numbers of the persons responsible for receiving the data. CSEGC-2011 clause 12.1.1

6.12 Settlements:

6.12.1 All intra state user(s) shall normally be operated according to the standing frequency linked load dispatch guidelines issued by the SLDC to the extent possible, unless otherwise advised by the SLDC except the generators exempted by the Commission by an order or regulations. CSEGC-2011 clause 6.2.7.

6.12.2 Generation schedules and drawal schedules issued/revised by the State Load Despatch Centre shall become effective from designated time block irrespective of communication success. CSEGC-2011 clause 6.8.

6.12.3 In all the BDI cases, the quantum of the schedule shall be the one after BDI and the applying the time blocks.

6.12.4 On completion of the operating day SLDC shall publish the final implemented schedule of all the registered user of the State grid on its website.
³¹[Certification of the BDIs indicating the period, quantum and reasons, with respect to the schedules shall be done by the SLDC]. And the same can be obtained by the entities undergone such backing down.

6.12.5 In case of congestion the entities responsible for creating the congestion shall have to bear the congestion charges over and above of the other charges applicable on them.

6.13 Non-compliance:

³¹ Rev 03: The term “reasons” added to the content of the certificate of BDI.

6.13.1 Service of Notice-

6.13.1.1 ³²[Issue of the notice at SLDC web site shall be considered as declaration and service of notice for any affect i.e Disturbance, BDIs, etc.]

6.13.1.2 Any letter, order or document addressed by the SLDC/licensee to the intra-state user shall be deemed to be duly given, if served in writing and delivered by hand at, or sent by post/ courier / fax / e-mail to the intra-state user address specified in the consumer's application or in the agreement with the intra-state user if entered into or as subsequently notified to the licensee. In case there is no person on the premises to whom the notice can with reasonable diligence be delivered, the notice may be served by affixing it on some conspicuous part of the premises.

6.13.1.3 All communications to the SLDC/licensee shall be made to the address as provided by SLDC/licensee. CSEGC-2011 clause 13.3.

6.13.2 Wrong declaration of capacity, non compliance of SLDC's load dispatch instructions, non-compliance of SLDC's instructions for backing down without adequate reasons, non-furnishing of data etc. shall constitute non-compliance of the Grid Code, which shall be subject to penal action as may be decided by the Commission.- CSEGC -2011 clause 13.2.2.

6.13.3 The cases of non-compliance of above BDI, SLDC will submit an application to CERC for imposing penalty under section 33(5) of electricity act 2003 on quarterly basis.

6.14 In special & exceptional cases of transmission constraints and in the interest of grid security SLDC shall have the rights to compromise with the above sequence with specific justification.

6.15 Following Commercial data to be provided by commercial section of CSPDCL time to time to SLDC.

- i. Fixed & variable cost of ISGS stations (Qtrly).
- ii. Fixed & variable cost of State Generating Units (Qtrly).
- iii. Merit order of generators.
- iv. Short term power purchase agreements and their schedule by 23rd of preceding month.(Monthly).
- v. List and Power purchase rate of bio-mass generators along with name of 33KV feeders through which these generators are feeding 132/33 KV Substations.

³² Rev 03: Added in compliance with clause 6.5.17 of IEGC-2010.

6.16 ³³[Methodology by BDI Percentage calculation

(a) When system frequency is more than ⁵⁴[50.05] Hz.

$$\% \text{ BDI say ('X')} = \left\{ \frac{\text{Under drawl quantum from central schedule}}{\text{Total schedule of InSGS}} \right\} \times 100$$

- (i) **% BDI on InSGS:** If %BDI 'X' is less than 30%:- then full 30% BDI on InSGS.
- (ii) If % BDI 'X' is more than 30%:- then full 30% BDI on InSGS shall be applied including the injection schedule of the other Intra State entities also.
- (iii) ³⁴[In case of any Units capacity > 210 MW, additional % of BDI may be obtained from such Generating Capacity Units as and when the situation warrants].
- (iv) ³⁵[Notwithstanding the above, the SLDC may direct the InSGS/ other Intra State entities to increase/ decrease their drawal/ generation in case of contingencies e.g. overloading of lines/transformers, abnormal voltages, threat to system security. Such directions shall immediately be acted upon].

$$\% \text{ BDI on SGS} = X - 30\%$$

Example- If the UD is 200 MW and InSGS schedule is 400 MW

Then (i) BDI % on InSGS = 200/400 x100 = 50%

Since this % is more than 30% hence 30% BDI to be issued on InSGS & the balance % may be issued to the injection schedule of the other Intra State entities and the InSGS of higher installed generating capacity.

(ii) BDI % on SGS = 50-30 = 20%

³³ Rev 03: Methodology of calculation redefined based on the hearing on 23.01.2014.

³⁴ Added in Rev 02, to align the procedure and practice adopted at WRLDC and the clause 6.08.6.

³⁵ Rev 03: Added in incorporate the affect of clause 4(5) of 2nd amendment to the IEGC -2010 notified on 06.01.2014

(b) When UD is higher than ⁵²[12%] of schedule

$$\% \text{ BDI say ('X')} = \left\{ \frac{\text{UD quantum from CS} - 12\% \text{ of CS}}{\text{Total schedule of InSGS}} \right\} \times 100$$

CS - central schedule.

(i) % BDI on InSGS = [UD quantum from central schedule – (⁵²[12%] CS schedule)/total schedule of InSGS] x 100 (Say X) or 30% whichever is less.

(ii) If % BDI i.e. ('X') is more than 30% then

$$\% \text{ BDI on SGS} = X - 30\%$$

Example- If the UD is 200 MW against CS schedule of 800 MW and InSGS schedule is 400 MW, then % BDI of InSGS

$$= (200 - \sup{52}[12\%] \text{ of } 800) / 400 \times 100 = 30\% \\ \text{or } 30\% \text{ whichever is less} = 30\%$$

Note:-

1. In case of imposition of congestion charges by WRLDC, the ⁵²[12%] of CS schedule as in example ('b') shall not be considered & case (a) shall be applicable.
2. Considering the emergency situation, S/I of SLDC control room may deviate from the above calculation depending upon the gravity of prevailing conditions.

Rounding off:- The backing down instruction shall be followed to the nearest 0.5 MW digit round off. Say if by calculations the BDI come to 4.66 MW the BDI to be followed shall be for 5.00 MW; If by calculations the BDI come to 4.33 MW the BDI to be followed shall be for 4.50 MW.]

Annexure-IV A.

CHHATTISGARH STATE POWER TRANSMISSION COMPANY LIMITED

राज्य सरकार, छत्तीसगढ़
(C.G. Govt. Undertaking) **राज्य सरकार, छत्तीसगढ़**

STATE LOAD DESPATCH CENTRE: RAIPUR

राज्य सरकार, छत्तीसगढ़

PHONE: 0771- 2574172, FAX NO. 0771-2574174.

Web Site: sldccg.gov.in

email-csebsldc@gmail.com

Code	Date	Time	Frequency	OD/UD

To:

Sub: Backing Down Instructions (BDI)

Ø Quantity of BDI Desired :..... % of Schedule.....MW.

Ø Time of Operation/ Normalisation:.....

Ø Category of BDI :

Sr No.	BDI Type	Reason	Tick the appropriate box
I.	BDI- 1	High System Frequency (Freq>50.05 Hz)	
II.	BDI-2	Substantial under drawl of the Chhattisgarh State.	
III.	BDI-3	Over injection of state entities against the approved schedule quantum. (>105% in any time block of the schedule)	
IV.	BDI-4	Congestion in the network.	
V.	BDI-5	Transmission Constraint.	

Shift In charge

SLDC, CSPTCL

CC – (i) The ED (C&P), CSPTCL, Daganiya Raipur

(ii) The ED (Comm), CSPDCL, Daganiya Raipur

Approved copy

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Annexure-IV B

Format of BDI to be displayed on the WEB Site:

BACKING DOWN INSTRUCTIONS FOR THE MONTH OF (say Mar - 2013)												
S NO.	DATE	TIME		RESTRICTIO N CODE	Name of Entity	SCHED ULE	REQUESTED OF BDI		INJECTIO N AT THE TIME OF B/D	REASON		
		FROM	TO				in %age	In MW		FREQ (Hz)	UD (MW)	OTHER
a	b	c	d	e	f	g	h	i	j	k	l	j
1	02-03- 2013	12:01	16:36	CGLD/03/05	CIAL	18	40%	7.2	11.85	50.17	197	Due to High Under Drawl at High Frequency

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Annexure-IV C.

LOG BOOK REGISTER Format.

BACKING DOWN INSTRUCTIONS FOR THE MONTH OF (say Mar - 2013)

S NO	DATE	TIME		RESTRICT TION CODE	RELEASE CODE	NAME OF POWER STATION	SCHEDULE	REQUESTED QUANTUM OF BACKING DOWN (IN MW)	INJECTION AT THE TIME OF B/D	RELIEF OBTAINED (IN MW) AFTER GIVING BACKING DOWN INSTRUCTION	TOTAL DURATION (hh:mm)	REASON			PER CENT TAG E OF COMPL IAN CE	At the Time of Normalisation			Remarks , if any
		FROM	TO							WITH RESPECT TO SCHEDULE		FREQ (Hz)	UD (MW)	OTHER		INJECTION	Frequency	OD/ UD	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1	02-03-2013	12:01	16:36	CGLD/03/05	CGLD/03/19	CIAL	18	7.2	11.85	8.07	4:35	50.17	197	Due to High Under Drawl at High Frequency	100 %				

CHAPTER – 7: SCHEDULING & DESPATCH PROCEDURE

- 7.1 Scheduling:** - The scheduling activity shall be carried out at SLDC as per provisions under chapter 6 of the State Grid Code. All the intra-state users registered with SLDC shall be authorized to use State Grid as per the provisions of CSERC (SLDC Fee and Charges and other related matter) Regulation 2012. The scheduling activities are applicable to the Long Term, Medium Term and Short Term customers ³⁶[*registered with SLDC*].
- 7.2** The application for a bilateral transaction having the details, such as names and location of supplier and buyer, contracted power (MW) shall be scheduled and interface at which it is referred to, point of injection, point of drawal, starting time block and date, ending time block and date, and such other information that may be required.
- 7.3** Availability declaration by ⁵⁹[InSGS] shall have a resolution of one (1) MW and one (1) MWh, all entitlements, requisitions and schedules shall be rounded off to the nearest two decimal at each control area boundary for each of the transaction, to have a resolution of 0.01 MW and 0.01 MWh”.
- 7.4** Further, when a State utility or an intra-State entity proposes to participate in trading through open access the MW up to which the entity may submit a buy or sell bid in the open access shall specified.
- 7.5** If the Open Access Customer (STOA) customers are selling electricity for only interstate STOA than the scheduling shall be governed as per CERC's regulation and detailed procedure.
- 7.6** The intra state entities (seller/buyer) shall be responsible for maintaining capacity of power generation / injection/drawl as applicable, at the bus bar of injection/drawl point as per the approved/scheduled quantum.
- 7.7** It shall be incumbent upon the seller to declare the plant capability faithfully in pursuance with the relevant provisions of IEGC and CSEGC.
- 7.8** The injection of the energy by the STOA customers at the injection / interface point shall be including the transmission losses over the approved / scheduled quantum.
- 7.9** The scheduling and dispatch procedure specified here shall not be applicable to any users availing short-term intra-state or short term inter state open-

³⁶ Inserted in Rev-01 Vide SLDC letter No 1484 Dated 18/10/2013.

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access but shall be applicable to intra state long and medium term open access customer & state generating stations. The time line for Day Ahead Scheduling & despatch by SLDC, SGS, InSGS, and intra state Medium and short term OA customer & beneficiaries / bulk consumers and will be as given under:

Time	Activity	Action to be taken By
09:00 Hr	i) Furnishing Station wise DC (Ex-PP) in MW and MWH by SGS, Intra State seller and demand of beneficiaries / bulk consumers (DISCOM) for 0 to 24 Hrs in 15 min. blocks for next day. Hydel units to intimate the availability of units & reservoir level. ii) Intra State OA Customers to indicate Import/Export on 15-MIN Basis	i) State Generators and DISCOM ii) Intra State Long & medium OA Customers
10:00 Hr	Compilation of DC of SGS, InSGS for different blocks for next day of beneficiaries / bulk consumer after the receipt of information from WRLDC regarding the MW and MWh entitlement from central sector stations.	SLDC
11:00 Hr	SLDC to send the entitlement of complied MW and MWh of Generating stations including ISGS to CSPDCL.	SLDC
12:00 Hr	DISCOM will furnish requisition in each ISGS & SGS stations to SLDC.	DISCOM
14:00 Hr	i) Check if any revision in DC requested by SGS, beneficiaries / bulk consumers etc. ii) Prepare and despatch injection schedule to SGS and drawl schedule to beneficiaries / bulk consumers (DISCOM)	i) SGS and DISCOM ii) SLDC
15:00 Hr	Send ISGS Schedule to WRLDC as requisitioned by DISCOM	SLDC
17:00 Hr	The individual transactions for State Utilities/intra-State Entities shall be scheduled by the respective SLDCs. Collect (scheduling request of collective transaction)detailed break up of each point of injection and drawl within the state from Power exchange after approval of NLDC	SLDC
17:30 Hr	Confirm acceptance after checking the above to NLDC	SLDC
18:00 Hr	Final issue of schedule of collective transactions in the respective regional entity's and inter regional schedules.	SLDC

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Time	Activity	Action to be taken By
20:00 Hr	Convey Ex-Power plant dispatch schedule of SGS AND InSGS in MW and Net Drawl schedule to beneficiaries / bulk consumers (DISCOM) for 15 min. time block for the next day	SLDC
22:00 Hr	Before 2200Hrs convey any changes in Drawal Schedule of SGS, InSGS, beneficiaries / bulk consumers (DISCOM)	State Generators And DISCOM
23:00 Hr	Final Scheduling for the next day	SLDC
24:00 Hr	Issue Implemented Schedule (Including PAF of SGS) taking into account all before the fact changes in dispatch schedule of generating stations and drawal schedule of the beneficiary/ bulk consumer (*In case of mistake in schedule the same is to be notified within 3 days.)	SLDC * State Generators, DISCOM and Intra State Long & Medium Term OA Customers

- 7.10** The CGPs and IPPs who have entered into the short-term contract for power supply with CSPDCL, shall give a monthly schedule of their power supply to take place in next month to the CSPDCL by 23 of the month. A copy of this monthly schedule shall also be given to the SLDC. The power scheduled by CGP/IPP shall be within the range of power contracted with the CSPDCL.

Modality/energy accounting/settlement with respect to short term power purchase by CSPDCL will be governed by the Order issued by the Commission time to time in the regard.

- 7.11** CSPDCL will provide the PPA copies and schedule for the next month by 23rd of every month and merit order based on fixed & variable cost of state generators with six monthly updations. CSPDCL will also provide list of small generators including Biomass generators injecting power into the grid at 33KV along with name of such 33KV feeder and 132/ 33 KV Sub-station.
- 7.12** Bio-mass, small hydel, wind, solar and bagasse base power station installed in State and who are supplying power to any distribution licensee of the state shall continue to supply power as per orders of the Commission, in force.
- 7.13** An open access customer shall have to undertake to avail only one direction of power to be scheduled, either for injection or for drawal at any time block.

Elaboration : An Intra state entity having already an agreement under MTOA for sale of power at the interface point shall required to reduce its schedule for sale of power under MTOA to zero at any time block level when it is likely to purchase (draw) inter/ intra state short-term power.

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7.14 Revision of Schedules for ³⁷[Long Term and Medium Term Customers]

For short term power purchase by CSPDCL Modality/energy accounting/settlement/schedule with will be governed by the Order issued by the Commission time to time in the regard.

1. In case of bottleneck in transmission system, switch yard or Sub station, and DISCOM necessitating reduction in or forced tripping of any generator of SGS:- Effective from 4th block (counting the block in which bottleneck has taken place as One). During 1st, 2nd & 3rd block, the schedule generation and drawl schedule shall be deemed to have been revised.
2. Revision of DC by ³⁸ InSGS and requisition by DISCOM for the remaining period of the day will be effective from 6th block counting the block in which request has been received by SLDC. For the intra state transactions under LTOA, the revision request by the applicant only shall accepted and shall be effective earliest from the 00:00 hrs of the next scheduled date.
3. To discourage frivolous revisions, SLDC may, at its sole discretion, refuse to accept revisions of less than 2% of the previous DC/Schedule.
4. Revisions by the power generating stations shall be effective from 6 time-block, the first being the time –block in which notice was given. There may be maximum of 8 revisions for each 3 hour time slot starting from 00:00 hours during the day. ³⁹[In case of a plant emergency where multiple units trip and that are to be synchronized one by one, the DC may need to be revised accordingly several times for proper declaration of actual injection. In such cases the ceiling of 8 revisions in a day may be relaxed].
5. In case of any grid disturbance, scheduled generation of all the generating station (including CGP) and scheduled drawal of all the beneficiaries/buyers shall be deemed to have been revised to be equal to their actual generation/drawal for all the time blocks affected by the grid disturbance. Certification of grid disturbance and its duration shall be done by the SLDC.
6. The dispatch schedule for SGS, Other Generating power plants (including CGP) and net drawl schedules (including STOA) for beneficiary would be suspended on case to case basis as decided by SLDC/ WRLDC looking into the network and generation affected.
7. Generation schedules and drawal schedules issued/revised by the State Load Despatch Centre shall become effective from designated time block irrespective of communication success.

³⁷ Added in the Rev -02 based on the discussion s held on 22/10/2013.

³⁸ Rev 03: Deleted the word “SGS and”.

³⁹ Added in the Rev -02 based on the discussion s held on 22/10/2013.

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8. In any case, if only one part of the state system or one station of the SGS is affected, the schedules would not be suspended but only revised.
- 7.15** In accordance with the clause 6.10 of the CSEGC-2010, On completion of the operating day, by 24.00 hours, the schedule finally implemented (including PAF in case of State generating station) during the day, taking into account all before the fact changes in dispatch schedule of generating stations and drawal schedule of the beneficiary/bulk consumer, shall be issued by SLDC.
- 7.16** In case of any mistake / omission is detected / noticed in the schedule within 3 days of publication on SLDC website, the SLDC shall check and rectify the same.
- 7.17** This schedule shall be the datum for commercial accounting. The average ex-bus capability for each of the generating stations shall also be worked out based on all before-the-fact advice to SLDC.
- 7.18** A procedure for recording the communication regarding changes to schedules duly taking into account the time factor are recorded in a separate register at SLDC.
- 7.19** Any IPP/CPP or seller shall not be eligible for using state grid for transmission or wheeling of the electricity which has entered in PPA with licensee or consumer and terminate the agreement prematurely, for a period of three years from the date of termination of such agreement or till the scheduled date of termination of such agreement period whichever is earlier; if any order or ruling is found to have been passed by an appropriate Commission or Competent Court against the generating company for material breach of the terms & conditions of said PPA.
- 7.20** ⁴⁰[As per the regulations 7 (10) of CERC (Deviation Settlement Mechanism and related matters) -2014 “**Limits on Deviation volume and consequences of crossing limits**” in the event of sustained deviation from schedule in one direction (positive or negative) by any entity, such entity (buyer or seller) shall have to make sign of their deviation from schedule changed, at least once, after every 12 time blocks. To illustrate, if an entity has positive deviation from schedule from 07.30 hrs to 10.30 hrs, sign of its deviation from schedule shall be changed in the 13th time block i.e. 10.30 to 10.45 hrs from positive to negative or negative to positive as the case may be].

⁴⁰ Rev 03: Adopted from the CERC (DSM & related matters) regulations 2014 enforced from 17.02.2014.

CHAPTER –8: DATA LOGGING AND REGISTRATION

8.1 Registration:

8.1.1 All intra-State users (except the bulk consumers and captive users) shall be required to register at SLDC. These shall be generating plants, captive generating plants, licensees directly connected to State grid, stand alone generating plants who avail the services of SLDC for REC and other intra-State entities in compliance to the Chhattisgarh State Electricity Regulatory Commission (Fees and charges of State Load Despatch Centre and other related matters) Regulations, 2012.

8.1.2 The SLDC, after scrutinizing application and after being satisfied with correctness of the information furnished in the application shall register the applicant in its register duly intimating the applicant about its acceptance.

8.1.3 SLDC shall maintain a list of registered intra-State users on its website. The SLDC shall file consolidated information about the generating station and Licensees connected to the intra-State transmission network and distribution network and being monitored /serviced by it, to the Commission every year by end of April every year.

8.1.4 List of Documents required for Registration at CGSLDC:-

1. Certificate of Incorporation. (CIN)
2. Memorandum of Articles & Memorandum of Association.
3. Director Identification Number. (DIN)
4. Permanent Account Number (PAN) of Directors.
5. Photo of Directors & PAN Card Copy.
6. Registered office address.
7. Residential address of Directors.
8. Address of Plant.
9. No dues certificate from Distribution Licensee and Transmission Licensee.
10. Copy of PPA with Distribution Licensee.(For export-infirm power. Copy of Sale invoices, if any)
11. Copy of HT agreement. (For infirm power)
12. A proof about generating capacity by Electrical Inspector and copy of your agreements with Pollution Board.
13. Single line diagram of Switchyard.
14. Connectivity agreement with the licensee.
15. A proof about commercial operation of generator i.e., running of generator continuously for 72 hours as per the procedure laid down by CEA.
16. Availability of transfer of real time data to SLDC, SCADA system.
17. Registration fee of SLDC in SLDC Development A/c.

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18. Status of AMR status for ABT meter readings & ABT Meter details.
19. Implementation Agreement (IA) for your Power Project between govt. of CG & your Good self for which registration is sought.
20. Format –II in compliance to the regulation 24 of the F&C Regulation-2012.

8.2 Data logging:

- 8.2.1** All the intra-state users are responsible for submitting the up-to-date data in accordance with the provisions of the Grid Code. All the intra-state users shall provide SLDC/STU, the details alongwith the persons responsible for receiving the data.
- 8.2.2** All the intra-state users are obliged to supply the data referred to in the individual Sections of the Grid Code and listed above. In case any data is missing and not supplied by the intra-state user, SLDC may act reasonably.

8.3 Data Registration:

8.3.1 Responsibility:

- 8.3.1.1** All the intra-state users are responsible for submitting the up-to-date data in accordance with the provisions of the Grid Code. All the intra-state users shall provide SLDC/STU, the names, addresses, and the telephone numbers of the persons responsible for sending the data. SLDC/STU shall inform all the intra-state users the names, addresses and telephone numbers of the persons responsible for receiving the data.
- 8.3.1.2** SLDC shall provide up-to-date data to intra-state users as provided in the relevant Chapters of the Grid Code.
- 8.3.1.3** Responsibility for the correctness of these data rests with the concerned intra-state users providing the data.
- 8.3.1.4** The data schedules are structured to serve as standard formats for data submission and these formats shall be used for written data submission. Wherever standard data formats are not given, these should be developed by SLDC/STU in consultation with the intra-state users.
- 8.3.1.5** Wherever a computer data link exists between the intra-state user and SLDC, data may be submitted through this link. The data shall be in the same format as specified for paper transmission except for electronic encoding for which some other format may be more appropriate. The intra-state user shall specify the method to be used in consultation with

Chhattisgarh State Grid Operating Procedure-2011

STU/SLDC and resolve issues such as protocols, transmission speeds etc., at the time of transmission.

8.3.2 Changes in intra-state user's data:

8.3.2.1 Whenever the intra-state user becomes aware of the change to any items of the data registered under license, the intra-state user must promptly notify the SLDC of the changes. SLDC on receipt of the changes shall promptly correct the database accordingly. This shall also apply to any data compiled by SLDC regarding his own system.

8.3.3 Data not supplied:

8.3.3.1 All the intra-state users are obliged to supply the data referred to in the individual Sections of the Grid Code and listed above. In case any data is missing and not supplied by the intra-state user, SLDC may act reasonably. If and when necessary, he may estimate such data depending upon the urgency of the situation.

8.3.3.2 Similarly in case any data is missing and not supplied by SLDC, the concerned intra-state user may, act reasonably. If and when necessary, he may estimate such data depending upon the urgency of the situation. Such estimates, in each case, shall be based upon the corresponding data for similar plant or apparatus, or upon such other information, the intra-state user or SLDC, as the case may be deems appropriate.

8.4 Special considerations:

SLDC or any intra-state user may at any time make reasonable request for extra data as necessary.

Xxx0xxX

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Annexure- V

CHHATTISGARH STATE POWER TRANSMISSION COMPANY LIMITED

(C.G. Govt. Undertaking)

STATE LOAD DESPATCH CENTRE: RAIPUR

PHONE: 0771- 2574172, FAX NO. 0771-2574174.
Web Site: sldccg.gov.in email-csebsldc@gmail.com

Code No. CGLD/ /	Dtd.	Time:
System Frequency: Hz	CG System Status:	MW(+OD/-UD)

NOTICE

To,

The Shift In-charge,
M/s _____,
_____,
_____.

Sub: Notice for Over Injection / Drawal, Under Injection / Drawal.

The following are your present status against the given quantum of schedule:-

Injection Schedule		Drawal Schedule	
Schedule (in MW)		Schedule (in MW)	
Injection (in MW)		Drawal (in MW)	

As such in view of safe and secure grid operations, SLDC, CSPTCL hereby directs you that:-

- As per clause 6.2.3 of CSEGC-2011, 6.4.12 of IEGC-2010 and Electricity Act 2003 clause 33 (1) please immediately decrease/increase your injection/drawl and to be on par with schedule.
- Further, it may also please be noted that in case of continuous violations, System Security under threat and deterioration of parameters persists, SLDC, CSPTCL may open your lines connected to CSPTCL grid without any further notice in the interest of Grid Security as per clause 5.2.2 (iii) of CSEGC-2011.
- System Security:.....

Matter Most Urgent Please.

Shift In charge
SLDC: CSPTCL: Raipur

Copy to:

- The Executive Director (Commercial), CSPDCL, Raipur.
- The Executive Director (SLDC), CSPTCL, Raipur.
- The Executive Director (C&P), CSPTCL, Raipur.
- The Shift In charge, WRLDC, Plot No. F-3, MIDC Area, Marol, Andheri (East), Mumbai-400093, Fax No- 022 28202630.

(Please strike, whichever is not applicable).

Annexure- VI

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DAILY PERFORMANCE REPORT (DPR)

⁴¹[Daily Performance Report (DPR) formats to be published by SLDC, CSPTCL on the web site].

SHEET NO.	DETAIL NAME OF SHEET
R1	DAILY REPORT OF C.G.STATE POWER SYS.
R2	HIGHLIGHT OF CSEB
R3	EXECUTIVE SUMMARY GENERATION
R4	INTRA STATE REGIONAL DEMAND & SUPPLIES
R5	GENERATION DEM. DRAWL SHEET
R6	VOLTAGE PROFILE
R7	W.R. OUTAGES
R8	FREQUENCY GRAPH & ANALYSIS
R9	WRLDC / CEA REPORT
R10	CSPTCL PERFORMANCE REPORT
R11	POWER SUPPLY POSITION

v SAMPLE REPORT IS ANNEXED AHEAD.

v PS:- DATA ARE NOT FOR COMMERCIAL USE.

⁴¹ Rev 03: Added for information.

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R1

DAILY REPORT OF CHHATTISGARH POWER SYSTEM

HIGHLIGHTS FOR THE DATE:		02-Feb-14	AT 06:15 HRS.
TOTAL INSTALLED CAPACITY (THERMAL)	2280 MW	CS SHARE	= 926 MW
CAPACITY ON BAR (THERMAL)	2230 MW	BILATERAL IMP(+)/EXP(-)	= -162 MW
HYDEL CAPACITY AVAILABLE	139 MW	AVAILABILITY	= 2891 MW
UNITS UNDER OUTAGE	KEB #3 50 MW	STOPPED AT 19:20 HRS/01-02-2014 DUE TO S/H TUBE LKG.	

REPORT FOR THE DATE:- 01-Feb-14					
TOTAL THERMAL GENERATION		473.773	LU		
PLANT LOAD FACTOR	DAILY	86.58	%		
	CURRENT MONTH	86.58	%		
	CURRENT FY	60.27	%		
TOTAL HYDEL GENERATION		8.914	LU		
TOTAL THERMAL+HYDEL GENERATION		482.687	LU		
MAXIMUM DEMAND MET	3122 MW	AT 19:00 HRS.		AVAILABILITY WHEN MAX DMD MET = 3202MW MAX UNRESTRICTED DMD WITH FREQ CORRECTION = 3147MW AT 19:00 HRS LOAD RELIEF = 23MW	
MINIMUM DEMAND MET	2339 MW	AT 5:00 HRS.			
AVERAGE DEMAND	2652 MW				
PARTICULARS	GENERATING CAPACITY IN MW	GENERATING CAPACITY IN LU	ACTUAL GEN IN LU	PLF IN %	REMARKS
THERMAL GENERATION					
KORBA EAST UNIT No 1	50 MW	12.00 LU	10.000	83.33	STOPPED AT 19:20 HRS/01-02-2014 DUE TO S/H TUBE LKG.
UNIT No 2	50 MW	12.00 LU	9.901	82.51	
UNIT No 3	50 MW	12.00 LU	6.870	57.25	
UNIT No 4	50 MW	12.00 LU	3.837	31.97	
UNIT No 5	120 MW	28.80 LU	23.045	80.02	
UNIT No 6	120 MW	28.80 LU	23.467	81.48	
TOTAL KORBA EAST	440 MW	105.60 LU	77.120	73.03	
KORBA EAST EXTN UNIT No 1	250 MW	60.00 LU	55.540	92.57	
UNIT No 2	250 MW	60.00 LU	55.480	92.47	
TOTAL KORBA EAST EXTN	500 MW	120.00 LU	111.020	92.52	
KORBA WEST UNIT No 1	210 MW	50.40 LU	49.887	98.98	
UNIT No 2	210 MW	50.40 LU	48.766	96.76	
UNIT No 3	210 MW	50.40 LU	48.407	96.05	
UNIT No 4	210 MW	50.40 LU	43.693	86.69	
UNIT No 5	500 MW	120.00 LU	94.880	79.07	
TOTAL KORBA WEST	1340 MW	321.60 LU	285.633	88.82	
TOTAL THERMAL GENERATION	2280 MW	547.20 LU	473.773	86.68	
TOTAL AVAILABLE THERMAL GEN	2280 MW	547.20 LU	438.795	80.19	
HYDEL GENERATION					
BANGO UNIT No 1	40 MW	9.60 LU	4.200		
UNIT No 2	40 MW	9.60 LU	1.950		
UNIT No 3	40 MW	9.60 LU	0.000		
TOTAL BANGO	120 MW	28.80 LU	6.150		16:20
GANGREL UNIT No 1	2.5 MW	0.6 LU	0.610		
UNIT No 2	2.5 MW	0.6 LU	0.610		
UNIT No 3	2.5 MW	0.6 LU	0.610		
UNIT No 4	2.5 MW	0.6 LU	0.610		
TOTAL GANGREL	10 MW	2.4 LU	2.440		96:00
SIKASAR UNIT No 1	3.5 MW	0.84 LU	0.000		
UNIT No 2	3.5 MW	0.84 LU	0.000		
TOTAL SIKASAR	7 MW	1.68 LU	0.000		0:00
KORBA WEST MINI-MICRO HYDEL	1.7 MW	0.204 LU	0.324		48:00
TOTAL HYDEL GENERATION	138.7 MW	33.084 LU	8.914		
TOTAL THERMAL +HYDEL			482.687		
TOTAL AUX CONSUMPTION			41.134		
UNITS SUPPLIED EX-CSPTCL BUS			441.553		
OTHER INJECTION (ESTIMATED)			25.200		
INTER / INTRA (OA) INJECTION			54.730		
INTER STATE STOA SCHEDULED			-20.030		
UNITS AVAILABLE EX-CSPTCL BUS			501.453		
CSPTCL CONSUMPTION			642.328		
BILATERAL IMP(+)/EXP(-) + BSP SCHEDULE			-11.170		
CS DRAWL TO MEET STATE DEMAND			120.845		

MAJOR INTERRUPTION ON EHV LINES: AS PER THE ENCLOSED SHEET.

LOAD SHEDDING (IF ANY): AS PER THE ENCLOSED SHEET.

Shift Incharge: SLDC:CSPTCL : RAIPUR

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Chhattisgarh State Grid Operating Procedure-2011



STATE LOAD DESPATCH CENTER RAIPUR, CHHATTISGARH STATE POWER TRANSMISSION COMPANY LTD,

(Successor Company of CSEB)

HIGHLIGHTS OF GENERATION & DEMAND AT 06:15 HRS OF

DATE 02-Feb-14

STATION # UNIT	INSTALLED CAPACITY (MW)	ACTUAL GEN. IN (MW) AT 06:15AM	LAST TRIPPING DATE	AT TIME	SYNCHRONISATION DATE	AT TIME	REASON OF TRIPPING
KORBA(E) # 1	50	35	09-12-2013	22:30	10-12-2013	03:54	BTL
KORBA(E) # 2	50	41	29-01-2014	18:40	30-01-2014	14:35	ECO. TUBE LKG.
KORBA(E) # 3	50	0	01-02-2014	19:20	-	-	SH TUBE LKG.
KORBA(E) # 4	50	29	31-01-2014	06:00	01-02-2014	12:47	OUTAGE OF BALL MILL 4A
KORBA(E) # 5	120	95	30-01-2014	18:20	30-01-2014	18:35	ECCENTRICITY HIGH
KORBA(E) # 6	120	98	13-01-2014	21:25	15-01-2014	00:30	BTL
KORBA(E) EXTN # 1	250	241	10-02-2013	23:05	16-12-2013	22:00	DUE TO TURBINE PROBLEM
KORBA(E) EXTN # 2	250	233	24-01-2014	11:58	29-01-2014	00:59	BTL
KORBA(W) # 1	210	214	09-12-2013	22:32	09-12-2013	17:33	R/H T/L
KORBA(W) # 2	210	207	07-01-2014	23:32	09-01-2014	05:47	FURNACE PRESSURE HIGH
KORBA(W) # 3	210	199	24-01-2014	01:22	25-01-2014	05:42	FURNACE PRESSURE HIGH
KORBA(W) # 4	210	200	27-01-2014	06:50	29-01-2014	05:26	SCREEN S/H T/L
KORBA(W) # 5	500	391	29-01-2014	02:01	30-01-2014	22:21	FEED CONTROL VALVE-16 PROBLEM
TOTAL (THERMAL)	2280	1983					
			YDAY GEN(IN LU)				YDAY RUNNING HOURS
BANGO # 1	40	0	4.20				11:15
BANGO # 2	40	0	1.95				05:05
BANGO # 3	40	0	0.00				0:00
TOTAL BANGO	120	0	6.15				16:20
BANGO DAM LEVEL & LIMIT IN MTRS	PRESENT	357.79	F.R.L.	359.66	MINIMUM	333.66	
TOTAL GANGREL	10	10	2.43877				96:00
GANGREL DAM LEVEL IN MTRS	PRESENT	347.18					
TOTAL SIKASAR	7	0	0.000				0:00
MINI MICRO HYDEL KWB	1.7	0.0	0.32434				49:00
TOTAL HYDEL	138.7	10					
TOTAL THERMAL+HYDEL	2418.7	1815					

THERMAL CAPACITY ON BAR	2230	MW			CS SHARE	926
HYDEL AVAILABILITY	138.7	MW			INTER STATE STOA SCHEDULE	-125
CSPTCL THERMAL+HYDEL GEN	1815	MW	INTER/INTRA STATE(QA) INJECTION	170		
CSPTCL DEMAND MET	2655				CSPTCL AVAILABILITY	2891
LOAD SHEDDING (IF ANY)	0		OTHER INJED (ESTIMATED)	105	BILATERAL IMP(+)/EXP(-)	-162
UNRESTRICTED DEMAND	2655		TOTAL CPP INJECTION	275	CSPTCL INHAND AVAILABILITY	2729

PREVIOUS DAY STATUS AT A GLANCE

DATE 01-02-2014

PARTICULARS	IN LU	PARTICULARS	IN MW	REMARKS
TOT THERMAL GEN	473.773	MAX DEMAND(MET) AT 19:00 HRS	3122	1.LOAD SHEDDING, SHUT DOWN, BACKING DOWN, UNDER FREQ. & INTERRUPTIONS :- SHEET ENCLOSED (ANNEXURE - I)
TOT. AUX.CONSUMPTION	41.078	MIN DEMAND(MET) AT 5:00 HRS	2339	
NET THERMAL SENT OUT	432.695	Y'DAY AVG DEMAND	2652	2.OPEN ACCESS TRANSACTIONS :- SHEET ENCLOSED (ANNEXURE - II)
TOT. HYDEL GEN	8.914	MAX UNRESTRICTED DMD WITH FREQ CORRECTION = 3147MW	3147	3. KEB # 4 SYNCHRONISED AT 12:18HRS AND TRIPPED AT 12:24HRS, AGAIN SYNCHRONISED AT 12:47HRS/01-02-2014. 4. KEB # 3 STOPPED AT 19:20 HRS/01-02-2014 DUE TO S/H T/LKG.
TOT. AUX.CONSUMPTION	0.056	LOAD SHEDDING(IF ANY)	23MW	
NET HYDEL SENT OUT	8.858			
NET CSPTCL GEN 'A'	441.553			
OTHER INJECTION	25.200			
INTER/INTRA STATE(QA) INJECTION	54.730			
INTER STATE STOA SCHEDULED	-20.030			
TOTAL AVAILABLE 'B'	59.900			
C TOTAL ENERGY AVAILABLE IN THE STATE 'A-B'	501.453			
D CSPTCL CONSUMPTION	642.328			
E BILATERAL IMP(+)/EXP(-) + BSP SCHEDULE	-11.170			
F CRAWL FROM CS TO MEET STATE DEMAND	120.845			

Shift Incharge: SLDC/CSPTCL : RAIPUR

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ANNEXURE - I

ENCLOSURE SHEET FOR R1 & R2 FOR THE DATE

02-Feb-14

A. LOAD SHEDDING DONE ON

01-Feb-14

S.NO.	FROM	TO	EFFECTED GROUP/IND.	RELIEF IN MW	REASON
UNSCHEDULED					
NIL					
SCHEDULED					
ATAL JYOTI PUMP FEEDERS LOAD RELIEF(R.R. ONLY)				FROM	TO
				17:00	22:00
					23:30

B. NOTE :- LINES OPENED BY WR/LDC MUMBAI ON

01-Feb-14

NIL					
-----	--	--	--	--	--

C. SHUT DOWNS ON :-

01-Feb-14

	FROM	TO
1	10:28	11:49
2	31.01.14	
3	08:15	17:18
4	08:30	18:52
5	08:34	18:40
6	08:50	19:08
7	12:10	17:20
8	16:18	18:01

D. TRIPPINGS ON :-

01-Feb-14

	FROM	TO
1	19:25	19:34

E. INTERRUPTIONS ON :-

01-Feb-14

	FROM	TO
NIL		

F. U / F OPERATED ON :-

01-Feb-14

Sr. No.	NAME OF S/S	FROM	TO	L/R M.W.
NIL				

G. BACKING DOWN ON

01-Feb-14

Sr. No.	CODE NO.	THERMAL UNITS	FROM	TO	L/R M.W.
1	02/04	02/27	DSPM	08:25	18:10
2	02/09	02/25	KWB PH - I & II	13:12	18:08
3	02/10	02/26	KWB # 5	13:13	18:09
4	02/11	02/23	KEB PH - II & III	13:13	18:12
REASON OF BACKING DOWN :- FREQ.=50.06Hz,U/D.=400MW, TRANSMISSION CONSTRAINT.					

ENCLOSURE SHEET FOR "R2" FOR THE DATE

01-02-2014

ANNEXURE - II

OPEN ACCESS TRANSACTIONS :- (AS PER WR/LDC WEB SITE)

S.No	NODAL	APP.NO.	UTILITIES	FromDATE	ToDATE	SCHEDULE	ROUTE	CATEGORY
1	NR	23353A	NVVNL CSEB JK	01-Feb-14	01-Feb-14	1600-1700 : 14.87 MW	WR-ER-NR	ADVA
2	NR	23049A	PTC LTD CSEB NEPAL	01-Feb-14	28-Feb-14	0000-2400 : 80 MW	WR-NR	ADVA
3	WR	18650F	CSPTDCL CSEB ACBIL CSEB	01-Feb-14	02-Feb-14	0000-2400 : 9.76 MW	WR-WR	FCFS
4	SR	SEM1228	PTC LTD CSPTDCL CSEB KSEB			0000-1400 : 35.51 MW	WR-ER-SR	
5	SR	3WM1228	PTC LTD CSPTDCL CSEB KSEB			0000-1400 : 60.36 MW	WR-SR	

Shift Incharge: SLDC:CSPTCL : RAIPUR

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Chhattisgarh State Grid Operating Procedure-2011



STATE LOAD DESPATCH CENTER RAIPUR, CHHATTISGARH STATE POWER TRANSMISSION COMPANY LTD.

(Successor Company of CSEB)

EXECUTIVE SUMMARY SHEET : GENERATION

DATE:

1-Feb-2014

	DAILY GENERATION DATA IN LU				PROGRESSIVE GENERATION DATA IN MU						CSPTCL ENERGY BALANCE		
	GEN.	AUX.CO.	SENT OUT	PLF %	MONTHLY			YEARLY			CAPTIVE POWER INJECTION IN LU		
					GEN	TGT	PLF	GEN	TGT	PLF			
KORBA EAST BANK COMPLEX													
U # 1	10.000			83.33	1.000		83.33	224.622		60.97	OTHER INJECTION (ESTIMATED)	25.20	
U # 2	9.901			82.51	0.990		82.51	229.535		62.31	INTER / INTRA (OA) INJECTION	54.73	
U # 3	6.870			57.25	0.687		57.25	194.272		52.73	TOTAL CPP INJECTION	79.93	
U # 4	3.837			31.97	0.384		31.97	236.553		64.21	CSPTCL GEN INCL CPP	521.48	
PH-II	30.808	4.500	26.108	63.77	3.081		63.77	884.979		80.08	CS SHARE(EX CSEB)	198.47	
U # 5	23.045			80.02	2.305		80.02	378.025		42.76	INTERSTATE STOQ EXCHANGE	-20.03	
U # 6	23.467			81.48	2.347		81.48	550.611		62.28	CSPTCL AVAILABILITY	699.93	
PH-III	46.512	4.640	41.872	80.75	4.651		80.75	928.637		52.52	BILATERAL IMP(+)(EXP)(EX CSEB) + BSP SCHEDULE	-11.17	
KEB COMP.	77.120	9.140	67.980	73.03	7.712		73.03	1813.616		55.94	CSPTCL INHAND AVAILABILITY	688.76	
KORBA EAST BANK EXTENTION PROJECT													
U # 1	55.540	4.091	51.450	92.57	5.554		92.57	274.745		14.92	DRAWL CALCULATION	IMPORT	EXPORT
U # 2	55.480	4.011	51.470	92.47	5.548		92.47	1701.716		92.38	PGCL RAIPUR ICT 1	30.46	0.00
KE EXTN COMP	111.020	8.101	102.919	92.52	11.102		92.52	1976.462		53.65	PGCL RAIPUR ICT 2	25.54	0.00
KORBA WEST BANK COMPLEX													
U # 1	49.887			98.98	4.989		98.98	1399.820		90.47	PGCL RAIPUR ICT 3	23.99	0.00
U # 2	48.766			96.76	4.877		96.76	1415.988		91.51	KHEDAMARA - KWB CKT I	0.00	63.34
PH-I	98.653	9.515	89.138	97.87	9.865		97.87	2815.808		90.99	KHEDAMARA - KWB CKT II	0.00	63.40
U # 3	48.407			96.05	4.841		96.05	1197.677		77.41	CSPTCL B'PARA-PG B'PARA CKT	62.25	0.00
U # 4	43.693			86.89	4.369		86.89	1280.937		82.79	KWB - KSTPS CKT	16.34	0.00
PH-II	92.100	8.222	83.878	91.37	9.210		91.37	2478.615		80.10	KWB-RAITA-KHEDAMARA CKT	0.00	32.50
KWB PH-I+II	190.753	17.737	173.016	94.62	19.075		94.62	5294.423		85.54	RAIGARH-BUDHIPADAR	27.61	0.00
U # 5	94.880	6.100	88.780	79.07	9.488		79.07	1040.776		57.82	KEB-BUDHIPADAR CKT 2	0.41	2.47
KWB COMP	285.633	23.837	261.796	88.82	28.563		88.82	6335.199		79.30	KEB-BUDHIPADAR CKT 3	0.30	2.40
TOT THERMAL	473.773	41.078	432.695	86.58	47.377		86.58	10125.277		67.89	KTMKLA - ANNUPUR CKT 1	0.00	10.76
BANGO HYDEL PROJECT													
U # 1	0.200				0.420			82.470			KTMKLA - ANNUPUR CKT 2	0.00	10.80
U # 2	1.950				0.195			57.027			DNS - BALAGHAT	0.00	11.96
U # 3	0.000				0.000			84.746			CSEB RAIGARH - PG RAIGARH	5.15	2.42
TOT BANGO	6.150	0.034	6.116		0.615			224.243			NSPCL	56.76	0.00
GANGREL HYDEL PROJECT													
U # 1	0.610				0.061			9.569			CSPTCL DRAWL FROM GRID	120.84	
U # 2	0.610				0.061			8.577			CENTRAL SECTOR SCH	167.27	
U # 3	0.610				0.061			7.212			O/D(+), U/D(-)	-46.43	
U # 4	0.610				0.061			7.260			STATE CONSUMPTION(EXCL AUX)	642.33	
TOT GHPP	2.440	0.022	2.418		0.244			32.618			AVERAGE DEMAND(CONS/24HRS)	2676	
SIKASAR HYDEL PROJECT													
U # 1	0.000				0.000			0.070			MAX DEMAND MET	3122	
U # 2	0.000				0.000			1.182			LOAD FACTOR(AVG/MAX DMD) %	86	
TOT SHPP	0.000	0.000			0.000			1.252					
MIN-MICRO KWB	0.324		0.324		0.032			6.949			BANGO DAM LEVEL	357.79	
TOT HYDEL	8.914	0.056	8.858		0.891			265.063			GANGREL DAM LEVEL	347.18	
TOT(TH+HY)	482.687	41.134	441.553		48.269			10390.340			SIKASAR DAM LEVEL	NA	

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Chhattisgarh State Grid Operating Procedure-2011

STATE LOAD DESPATCH CENTER RAIPUR, CHHATTISGARH STATE POWER TRANSMISSION COMPANY LTD, (Successor Company of CSEB)

INTRA STATE REGIONAL DEMAND & SUPPLIES

DATE 04-Apr-14

REGION		CIRCLE	DISTRICT	LOAD (in MW)	
				MAX/ TIME	MIN/ TIME
1	AMBIKAPUR	AMBIKAPUR O&M	KORIYA		
			SURAJPUR		
			BALRAM PUR		
			SARGUJA		
			JASHPUR		
2	BILASPUR	BILASPUR O&M	BILASPUR		
			MUNGELI		
		RAIGARH	RAIGARH		
		Janjgir- Champa	CHAMPA		
		KORBA	KORBA		
3	DURG	DURG O&M	BALOD		
			BEMETARA		
			DURG		
4	RAIPUR	RAIPUR (O&M)	RAIPUR		
			DHANTARI		
			BALODABAZAR-B'PARA		
		RAIPUR (CITY-I)	RAIPUR		
		RAIPUR (CITY-II)	RAIPUR		
		MAHASAMUND	MAHASAMUND		
5	JAGDALPUR	JAGDALPUR O&M	DANTEWADA		
			KANKER		
			DANTEWADA		
			BASTAR		
			KONDAGAON		
6	RAJNANADGAON	RAJNANADGAON O&M	RAJNANDGAON		
			KABEER DHAM		

Shift Incharge: SLDC:CSPTCL : RAIPUR

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Chhattisgarh State Grid Operating Procedure-2011

STATE LOAD DESPATCH CENTER RAIPUR, CHHATTISGARH STATE POWER TRANSMISSION COMPANY LTD.

R5		GENERATION - DEMAND - DRAWL																				DATE		1-Feb-2014		TOTAL UNMET/NOTED DEMAND - V = T - G + D
Time in hrs	Frequency	CHHATTISGARH-GEN										CPP-GEN										CHHATTISGARH-LOAD	CHHATTISGARH-LOAD	CHHATTISGARH-LOAD	CHHATTISGARH-LOAD	
		(A) RBG Thermal	(B) RBG Thermal	(C) RBG Thermal	(D) RBG Thermal	(E) RBG Thermal	(F) RBG Thermal	(G) RBG Thermal	(H) RBG Thermal	(I) RBG Thermal	(J) RBG Thermal	(K) RBG Thermal	(L) RBG Thermal	(M) RBG Thermal	(N) RBG Thermal	(O) RBG Thermal	(P) RBG Thermal	(Q) RBG Thermal	(R) RBG Thermal	(S) RBG Thermal	(T) RBG Thermal	(U) RBG Thermal	(V) RBG Thermal	(W) RBG Thermal	(X) RBG Thermal	
1	50.07	330	471	519	389	1208	2009	1828	12	1840	221	105	2155	721	-123	2764	-152	2612	446	230	2396	-216	0	0	-6	2390
2	50.19	323	475	809	385	1204	2002	1822	12	1834	242	105	2161	721	-123	2779	-162	2627	446	213	2394	-233	0	0	-16	2378
3	50.08	323	471	816	390	1206	2000	1820	12	1832	229	105	2158	721	-123	2764	-152	2612	446	222	2388	-224	0	0	-7	2381
4	50.05	320	476	810	391	1209	2005	1825	12	1837	137	105	2075	552	-123	2508	-152	2357	278	265	2364	7	0	0	-7	2357
5	50.20	321	473	519	389	1208	2002	1822	12	1834	189	105	2128	663	-123	2568	-138	2632	404	211	2339	-150	0	0	-16	2323
6	49.97	316	473	820	393	1213	2004	1824	12	1836	228	105	2169	936	-123	2982	-47	2935	766	497	2686	-269	0	0	3	2689
7	50.07	324	469	519	391	1210	2003	1823	12	1835	302	105	2242	1080	-123	3169	-47	3122	880	697	2939	-163	0	0	-7	2932
8	50.15	316	470	820	397	1217	2003	1823	12	1835	209	105	2148	1050	0	3198	55	3253	1105	610	2958	-295	0	0	-16	2942
9	49.94	327	364	821	393	1214	1925	1762	92	1844	230	105	2175	1026	0	3205	46	3260	1071	769	2938	-312	0	0	5	2944
10	50.06	327	378	823	384	1217	1922	1749	92	1841	207	105	2153	797	0	3260	45	3285	642	623	2776	-219	0	0	-8	2768
11	50.11	319	377	823	380	1203	1999	1728	92	1820	168	105	2113	797	0	2910	45	2955	642	735	2848	-107	0	0	-11	2837
12	50.17	320	380	823	389	1212	1912	1740	52	1792	114	105	2011	643	0	2654	45	2689	688	550	2561	-136	0	0	-15	2546
13	50.19	332	382	822	389	1211	1925	1762	52	1804	174	105	2083	604	0	3087	45	3132	649	522	2805	-127	0	0	-17	2788
14	50.15	330	377	767	372	1139	1646	1680	52	1732	259	105	2096	604	0	2700	45	2745	649	383	2489	-256	0	0	-13	2476
15	50.11	340	377	763	372	1135	1652	1685	52	1737	172	105	2014	604	0	2619	45	2663	649	445	2459	-254	0	0	-9	2450
16	50.23	340	379	762	369	1131	1650	1684	52	1736	247	105	2098	601	-158	2511	-72	2639	751	438	2526	-313	0	0	-20	2506
17	50.07	336	381	767	371	1138	1667	1690	52	1742	228	105	2075	1020	-123	2972	45	3017	942	535	2810	-407	23	0	-6	2827
18	50.30	337	378	765	371	1136	1651	1684	92	1776	305	105	2206	991	-123	3074	55	3129	923	768	2974	-155	23	0	-31	2966
19	49.98	349	470	815	391	1206	2025	1843	92	1935	318	105	2358	912	-123	3147	55	3202	844	764	3122	-80	23	0	2	3147
20	50.06	318	468	519	392	1211	1997	1817	12	1829	301	105	2235	944	-123	3056	-47	3009	774	722	2957	-52	23	0	-5	2972
21	50.15	317	471	821	391	1212	2000	1820	12	1832	203	105	2140	1026	-123	3043	-302	2741	601	670	2810	69	23	0	-15	2818
22	50.20	311	473	514	393	1207	1991	1812	12	1824	267	105	2196	1050	-123	3123	-363	2770	674	384	2500	-190	23	0	-18	2505
23	50.17	308	471	515	390	1206	1985	1806	12	1818	242	105	2165	840	-123	2882	-89	2793	628	394	2559	-234	0	0	-15	2544
24	50.16	298	472	515	385	1210	1981	1903	12	1815	242	105	2162	746	-123	2779	-69	2680	529	235	2397	-293	0	0	-13	2384
MAX	50.30	349	476	823	397	1217	2025	1843	92	1935	325	105	2358	1050	0	3205	55	3253	1105	610	3122	69	23	0	5	3147
AVG	50.12	324	433	607	387	1194	1952	1776	39	1815	328	105	2148	833	-83	2889	-53	2845	697	504	2852	-193	6	0	-11	2847
MIN	49.94	299	377	762	369	1131	1646	1680	12	1732	114	105	2011	552	-158	2508	-363	2357	278	211	2339	-407	0	0	-31	2323
MOR PEAK MAX																						2958	AT 8:00 HRS.			
MOR PEAK MIN																						2686	AT 8:00 HRS.			
OFF PEAK MAX																						2848	AT 11:00 HRS.			
OFF PEAK MIN																						2339	AT 5:00 HRS.			
EVEN PEAK MAX																						3122	AT 19:00 HRS.			
EVEN PEAK MIN																						2610	AT 17:00 HRS.			

Shift Incharge: SLDC:CSPTCL : RAIPUR

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**STATE LOAD DESPATCH CENTER RAIPUR,
CHHATTISGARH STATE POWER TRANSMISSION COMPANY LTD,
(Successor Company of CSEB)
VOLTAGE PROFILE OF CSPTCL GRID**

Sr No.	Name of Substation	Voltage (in KV)			DATE	04-Apr-14
		Maximum	Minimum	Average	Reasons/ Comments	
1	400 KV Khedamara					
2	400 KV Raita					
3	400 KV Korba West					
4	220 KV Bhatapara					
5	220 KV Doma					
6	220 KV Siltara					
7	220 KV Mopka					
8	220 KV DSPMTPS					
9	220 KV Thelkadih					
10	220 KV Raigarh					
11	220 KV Bhilai					
12	220 KV Korba East					
13	220 KV Kotmi- Kala					
14	220 KV Paraswani					
15	220 KV Bemetara					
16	220 KV Gurur					
17	220 KV Barsoor					
18	220 KV Saraipali					
19	220 KV Suhela					
20	220 KV Banari					
21	220 KV Urla					

Shift Incharge: SLDC:CSPTCL : RAIPUR

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STATE LOAD DESPATCH CENTER RAIPUR, CHHATTISGARH STATE POWER TRANSMISSION COMPANY LTD, (Successor Company of CSEB)

WR Outages

DATE 04-Apr-14

CGS OUTAGES			ISGS OUTAGES		
(affecting the CG share)			(Within WR)		
ISGS	Capacity	Reasons	ISGS	Capacity	Reasons
KSTPS					
KSTPS - 7					
VSTPS-III					
VSTPS-IV					
SIPAT-I					
SIPAT-II					
TAPP- 3&4					
MSTPS-I					
JPL					
TOTAL	0	0	TOTAL	0	0

CHHATTISGARH OUTAGES		
(Major Units within CG State excl. ISGS)		
Unit	Capacity	Reasons
TOTAL	0	0

MP OUTAGES		
MP GENCO	Capacity	Reasons
TOTAL	0	0

GUJRAT OUTAGES		
GJ GENCO	Capacity	Reasons
TOTAL	0	0

MAHARASTRA OUTAGES		
MAHA GENCO	Capacity	Reasons
TOTAL	0	0

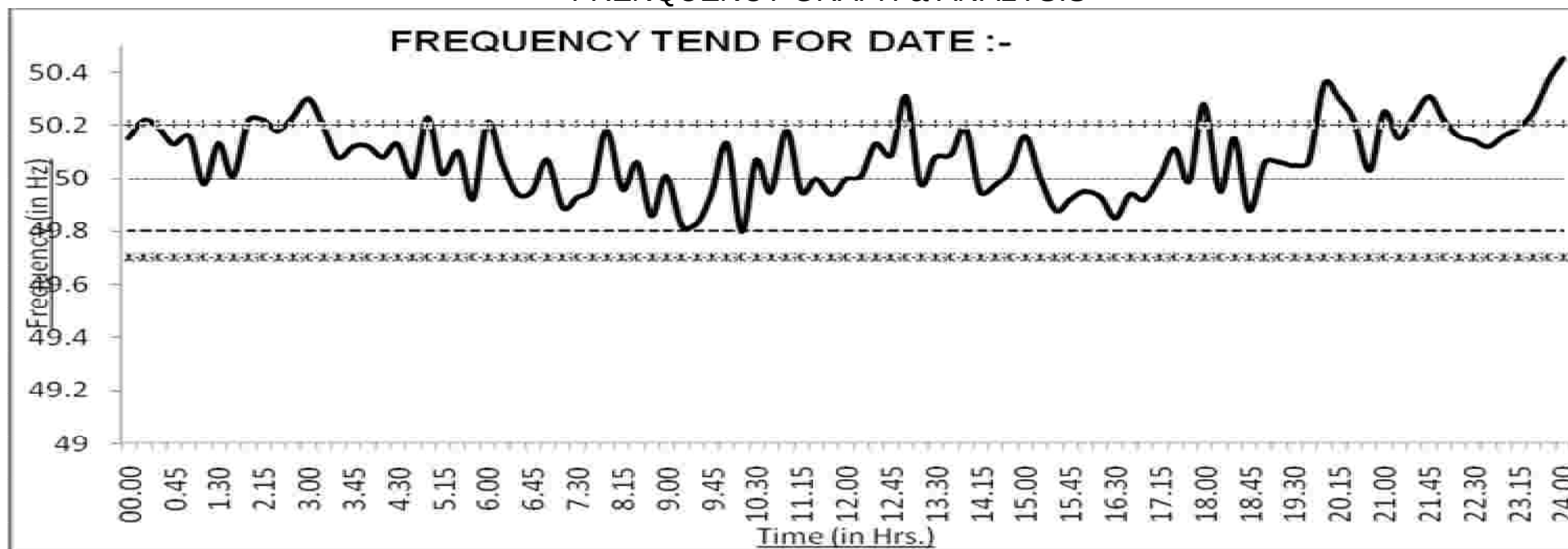
TOTAL WR OUTAGE
TOTAL GENERATION

Shift Incharge: SLDC:CSPTCL : RAIPUR

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FREQUENCY GRAPH & ANALYSIS



	Freq in Hz.	Time		No of time blocks	
Maximum Frequency recorded during the day			Freq > 50.20 Hz.		
Minimum Frequency recorded during the day			Freq. between 50.20 Hz & 50.05 Hz.		
Average Frequency of the day			Freq. between 50.05 Hz & 49.90 Hz.		
			Freq. between 49.90 Hz & 49.70 Hz.		
			Freq. < 49.50 Hz.		

Shift Incharge: SLDC:CSPTCL : RAIPUR

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STATE LOAD DESPATCH CENTER RAIPUR,
CHHATTISGARH STATE POWER TRANSMISSION COMPANY LTD,
(Successor Company of CSEB)
RAIPUR – 490 020. CHHATTISGARH.

FROM,
SHIFT INCHARGE (LD)
S.L.D.C. : C.S.P. T. C. L : RAIPUR

CONTROL ROOM PHONES :
0771 – 2574198, 2574193.
FAX - : 0771 - 2574174

TO,
DIRECTOR (FA),
GOVT. OF INDIA, CENTRAL ELECTRICITY AUTHORITY,
3rd FLOOR, SEWA BHAWAN, R.K.PURAM,
NEW DELHI.
FAX : 011-26107416

COAL REPORT FOR February-2014

DAILY REPORT FOR THE DATE : 13-Feb-2014

S. NO	POWER STN.	COAL LINKAGE * February-2014	COAL REC MT	MONTHLY PROG. REC MT	DAILY CONS. MT	MONTHLY PROG. CONS MT	STOCK MT
1	KORBA EAST	2.50 LAKH MT					
2	Dr.SPM TPS KE	2.70 LAKH MT					
3	KORBA WEST (including KWB#5)	3.50 LAKH MT					
4	MARWA STPS	LAKH MT					
	TOTAL		0	0	0	0	0

* COAL LINKAGE WITH SECL

Shift Incharge: SLDC:CSPTCL : RAIPUR

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C.S.P. T. C. L PERFORMANCE REPORT FOR THE DATE 13-Feb-2014

1. D.G.M. (GRID MANAGEMENT), WRDLC. FAX - 02228202630

2. DY. DIRECTOR, CEA. FAX - 01126170385 / 26107416

3. WREB, MUMBAI FAX NO 022-28370193

STN/UNIT NO.	GEN IN MU	SENT OUT	TIME IN HRS	DEMAND MW	SCH. RELIEF	UNSCH RELIEF
THERMAL						
KEB-II # 1	0.892	2.229	1	2510	0	0
KEB-II # 2	0.000		2	2483	0	0
KEB-II # 3	0.851		3	2441	0	0
KEB-II # 4	0.891		4	2408	0	0
KEB - PH II	2.634		5	2554	0	0
KEB-III # 5	1.936	3.514	6	2725	0	0
KEB-III # 6	2.018		7	2889	0	0
KEB - PH III	3.955		8	2961	0	0
KEB COMPLEX	6.589	5.742	9	2897	0	0
DSPM TPS # 1	5.159	9.480	10	2857	0	0
DSPM TPS # 2	5.170		11	2889	0	0
DSPM TPS TOTAL	10.329		12	2708	0	0
KWB-I # 1	4.779	8.486	13	2543	0	0
KWB-I # 2	4.661		14	2395	0	0
KWB - PH I	9.440		15	2411	0	0
KWB-II # 3	4.839	4.392	16	2535	0	0
KWB-II # 4	0.000		17	2705	23	0
KWB - PH II	4.839		18	2937	23	0
KWB # 5	9.911	9.545	19	3140	23	0
KWB COMPLEX	24.190	22.423	20	3006	23	0
MARWA STPS # 1			21	2868	23	0
MARWA STPS # 1			22	2682	23	0
MARWA STPS TOTAL			23	2604	0	0
TOTAL THERMAL	41.108	37.645	24	2664	0	0
HYDEL						
BANGO GEN	0.275	0.272				
GANGREL GEN	0.037	0.037				
SIKASAR GEN	0.000	0.000			MAX	MIN
MINIMICRO KWB	0.025	0.025	THERMAL GEN		1792	1579
TOTAL HYDEL	0.337	0.333	HYDEL GEN		84	4
TOTAL STATE GEN	41.445	37.978				
COAL CON. IN MT						
KORBA EAST	7294					
DSPMTPS	8866					
KORBA WEST (including KWB#5)	17144					
MARWA STPS						

Chhattisgarh State Grid Operating Procedure-2011

.....contd R10.

CENTRAL SEC KSTPS		UNIT OUTAGE / SYNCH. STATUS -				
KSTPS # 1	5.02	UNIT NO	DATE	TIME	REASON	EXP. TIME &DATE
KSTPS # 2	4.984	KWB # 4	07-02-2014	22:26	AOH	28-02-2014
KSTPS # 3	5.108					
KSTPS # 4	12.212					
KSTPS # 5	12.069	KEB # 2	10-02-2014	13:36	BTL	14-02-2014
KSTPS # 6	12.162					
KSTPS # 7	12.066					
TOTAL	63.621					
			IMPORT	EXPORT		
MPSEB IMP/EXP			0	3.14867548	U / F OPERATION :	
APSEB IMP/EXP			0	0	TOTAL No. OF TIME OPTD	MAX LOAD RELIEF (MW)
KSTPS-KORBA (W) AT KWB IMP/EXP			5.60	0.00	NIL	
BUDHIPADAR IMP/EXP			3.04796	0.184		
STATE DRAWL FROM GRID			20.20			
CENTRAL SECTOR SCH			20.15			
STATE CONSUM EXC AUX			65.24			
AUX. CONSUMPTION			3.467			
PEAK TIME DATA			MORN.	EVEN.		
	HRS	08:00	19:00			
DEMAND MET	MW	2961	3140			
FREQUENCY	Hz	50.18	50.06			
SCH.LOAD SH.	MW	0	23			
UNSCH LOAD SH.	MW	0	0			
BANGO DAM LEVEL	357.55					
FEEDER		IMPORT		EXPORT		
		MAX LOAD (MW)	MIN LOAD (MW)	MAX LOAD (MW)	MIN LOAD (MW)	
220 KV RAIGARH - B'PADAR CKT. NO. I		166MW/13:00hrs		75MW/18:00hrs		
220 KV KEB - B'PADAR CKT. NO. II		15MW/10:00hrs		5MW/10:00hrs		10MW/03:00hrs
220 KV KEB - B'PADAR CKT. NO. III		15MW/10:00hrs		5MW/10:00hrs		10MW/03:00hrs
220 KV KEB - B'PADAR CKT. NO. III		15MW/10:00hrs		5MW/10:00hrs		10MW/03:00hrs

FEEDER	IMPORT (in MU)	EXPORT (in MU)
220 KV RAIGARH - B'PADAR CKT. NO. I	2.7400	0.0000
220 KV KEB - B'PADAR CKT. NO. II	0.1580	0.0940
220 KV KEB - B'PADAR CKT. NO. III	0.1500	0.0900

MAX. VOLTAGE AT 400 KV S/S BHILAI	420KV/22:00hrs
MIN. VOLTAGE AT 400 KV S/S BHILAI	408KV/10:00hrs

Shift Incharge: SLDC:CSPTCL : RAIPUR

Chhattisgarh State Grid Operating Procedure-2011



DATE:- 13-Feb-2014

POWER SUPPLY POSITION REPORT

FAX TO :- C.E. GRID MANAGEMENT DN. CEA, NDELHI

KIND ATTN. SHRI N.C.GOEL C.E.

FAX NO 011-26170385

NAME OF STATE CHHATTISGARH

PEAK DEMAND (MW)

HOURS OF THE DAY	DEMAND MET(MW)	FREQUENCY CORRECTION (MW) 3.5% OF P1x(50-Fp)	DEMAND NOT MET			TOTAL DEMAND NOT MET (MW) P3+P4+P5 =P6	TOTAL ENERGY EQUIVALENT TO DEMAND NOT MET (MU)	TOTAL UNRESTRICTED DEMAND (MW) P=P1+P2+P6
TIME	P1 (1)	P2 (2)	DUE TO LOAD SHEDDING P3(3)	DUE TO STATUTORY POWER CUTS P4(4)	DUE TO T&D CONSTRAINTS P5(5)	P6 (6)	7	P (8)
1	2510	-14	0	0	0	0	0.00	2496
2	2483	-19	0	0	0	0	0.00	2464
3	2441	-26	0	0	0	0	0.00	2415
4	2408	-10	0	0	0	0	0.00	2398
5	2554	-21	0	0	0	0	0.00	2533
6	2725	-20	0	0	0	0	0.00	2705
7	2889	-7	0	0	0	0	0.00	2882
8	2961	-19	0	0	0	0	0.00	2942
9	2897	-1	0	0	0	0	0.00	2896
10	2857	-13	0	0	0	0	0.00	2844
11	2889	-18	0	0	0	0	0.00	2871
12	2708	0	0	0	0	0	0.00	2708
13	2543	-28	0	0	0	0	0.00	2515
14	2395	-16	0	0	0	0	0.00	2379
15	2411	-14	0	0	0	0	0.00	2397
16	2535	4	0	0	0	0	0.00	2539
17	2705	8	0	23	0	23	0.02	2736
18	2937	-29	0	23	0	23	0.02	2931
19	3140	-7	0	23	0	23	0.02	3156
20	3006	-38	0	23	0	23	0.02	2991
21	2868	-25	0	23	0	23	0.02	2866
22	2682	-21	0	23	0	23	0.02	2684
23	2604	-15	0	0	0	0	0.00	2589
24	2664	-42	0	0	0	0	0.00	2622
MAX	3140	8	0	23	0	23	0.02	3156
AVG	2701	-16	0	6	0	6	0.01	2690
MIN	2395	-42	0	0	0	0	0.00	2379

Shift Incharge: SLDC:CSPTCL : RAIPUR

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